

Aug. 20, 1935.

E. OLSON

2,012,137

PAPER CUTTING AND HANDLING MACHINE

Original Filed March 29, 1933 4 Sheets-Sheet 1

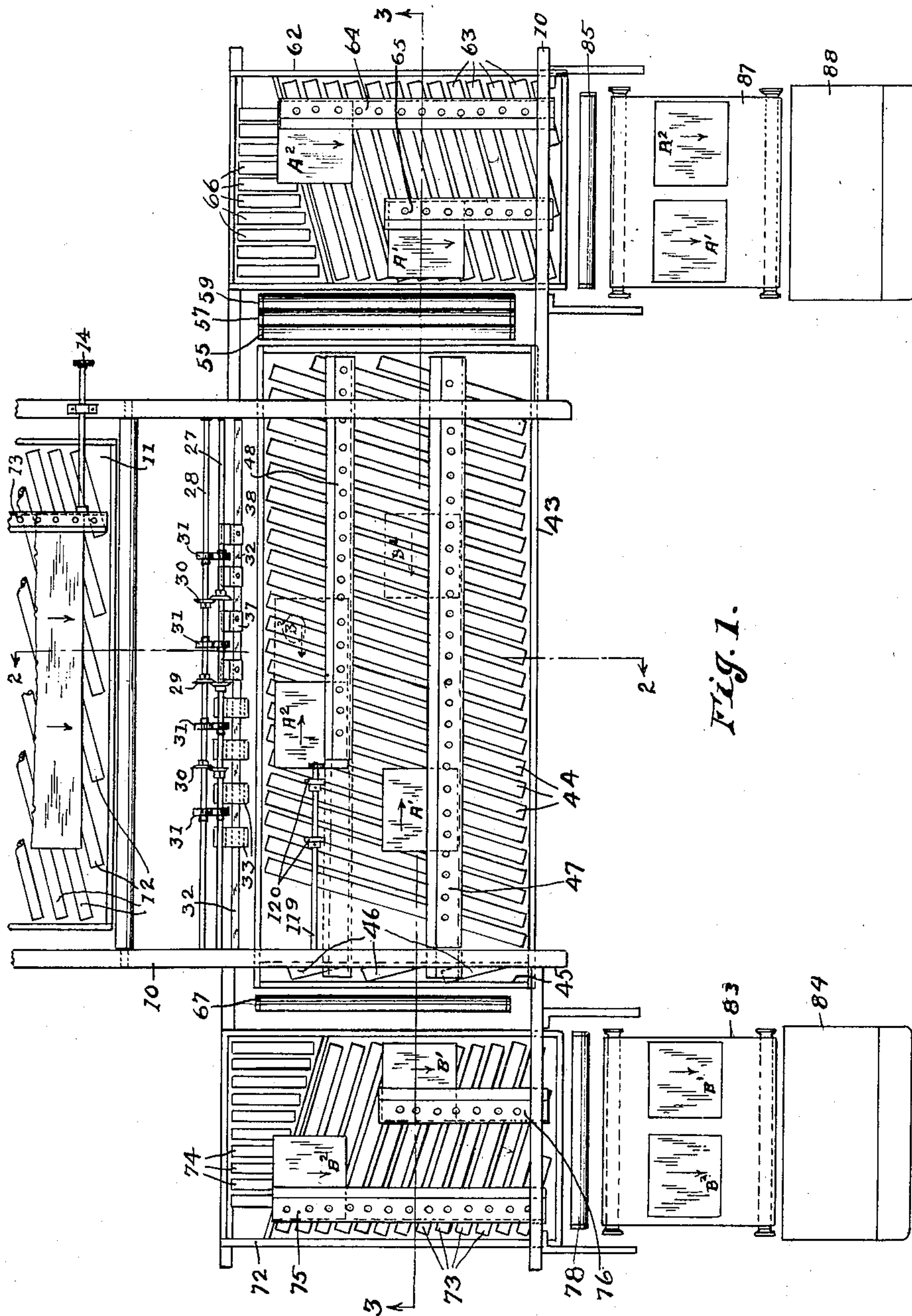


Fig. 1.

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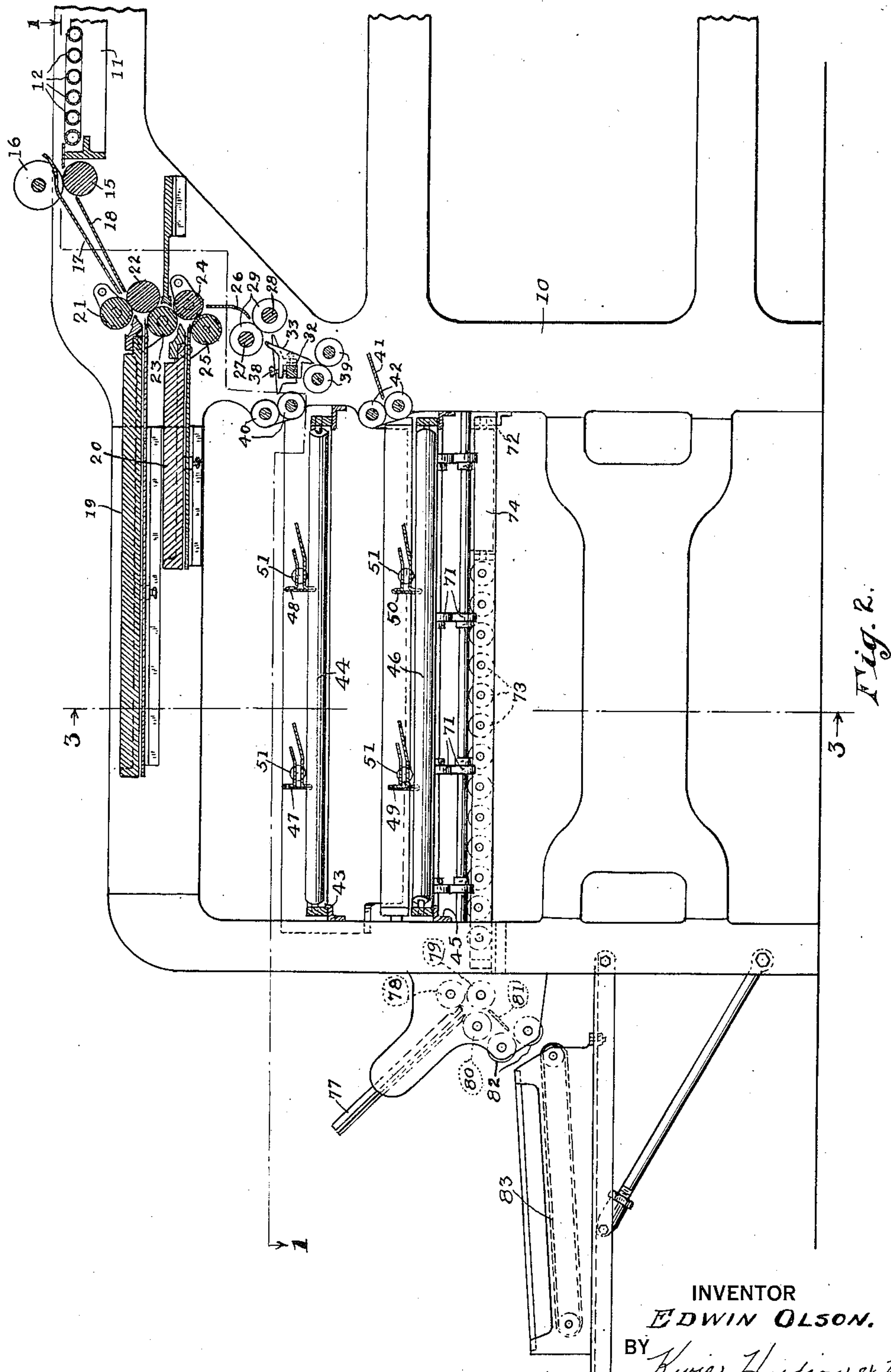
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2,012,137

PAPER CUTTING AND HANDLING MACHINE

Original Filed March 29, 1933 4 Sheets-Sheet 2



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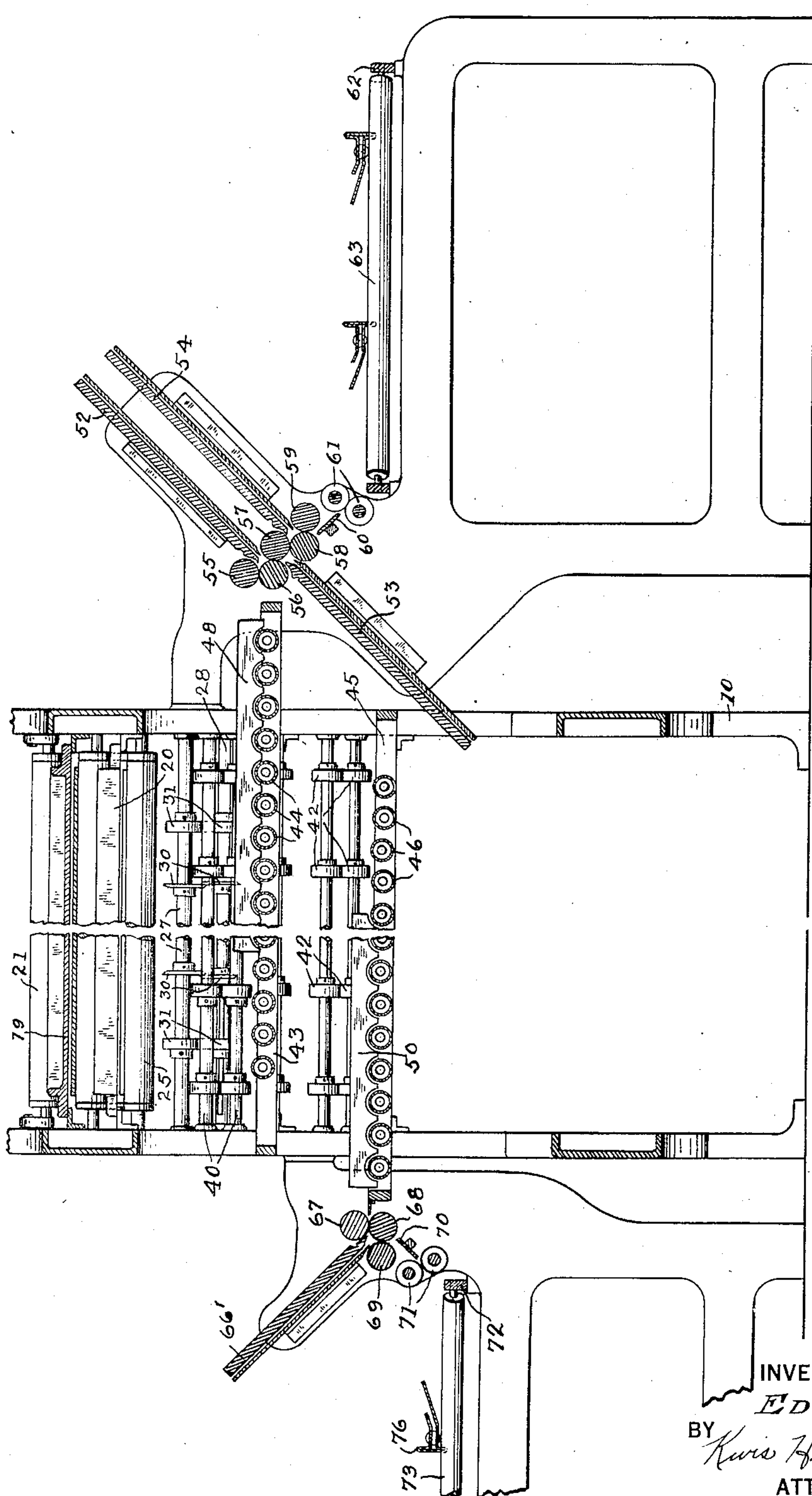
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2,012,137

PAPER CUTTING AND HANDLING MACHINE

Original Filed March 29, 1933 4 Sheets-Sheet 3



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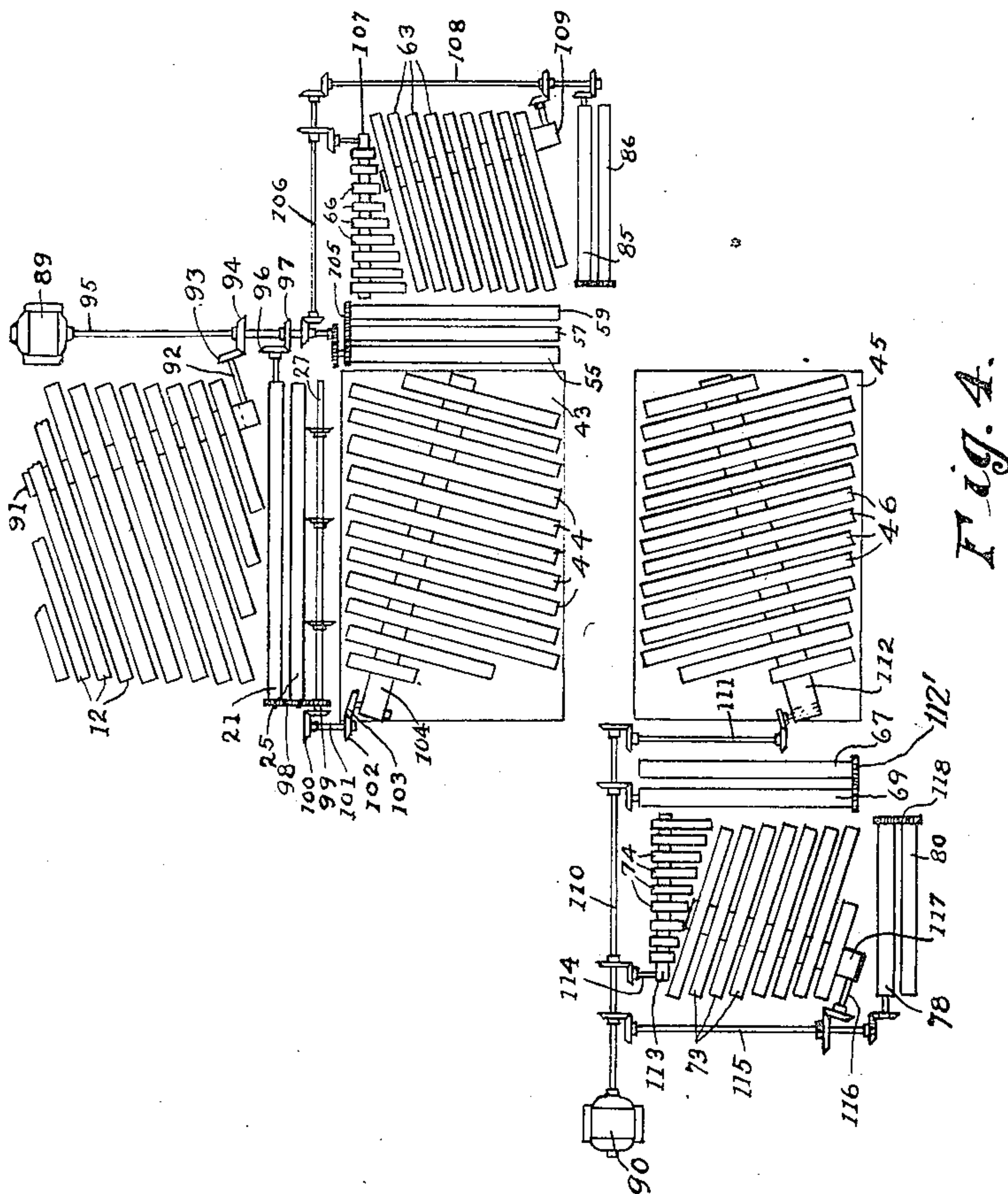
Aug. 20, 1935.

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2,012,137

PAPER CUTTING AND HANDLING MACHINE

Original Filed March 29, 1933 4 Sheets-Sheet 4



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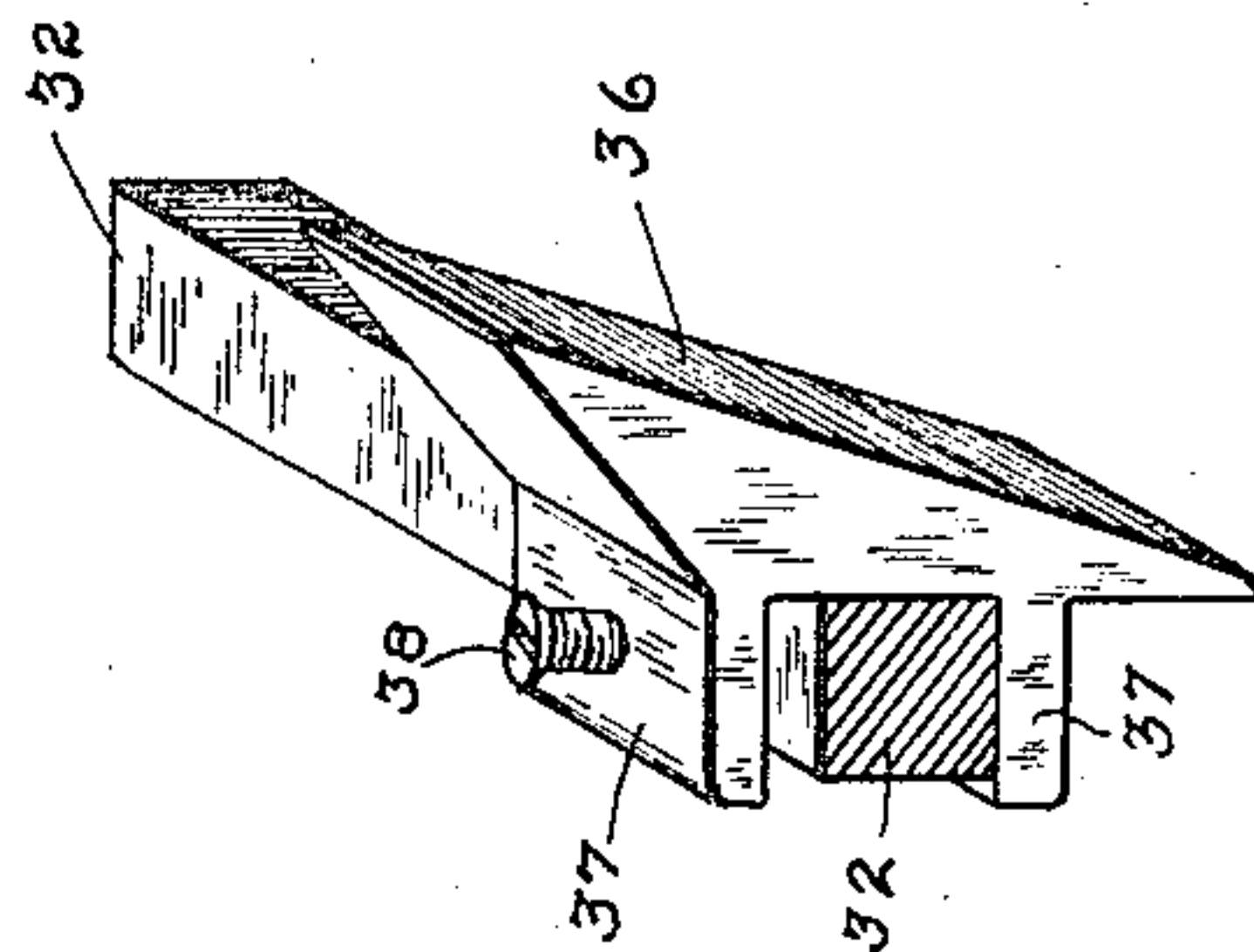


Fig. 5.

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UNITED STATES PATENT OFFICE

2,012,137

PAPER CUTTING AND HANDLING MACHINE

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Refiled for abandoned application Serial No. 663,328, March 29, 1933. This application December 28, 1934, Serial No. 759,600

26 Claims. (Cl. 270—68)

This application is a substitute for my application Serial No. 663,328 filed March 29, 1933 and renewed January 9, 1934 and which became abandoned October 6, 1934.

5 This invention relates to improvements in paper handling machines, particularly machines wherein paper sheets are cut apart by slitters, the divisions of the original sheet being fed in one given direction and then in a direction at
10 right angles to the original direction, the slit edge of each division becoming the leading edge during the right angle travel.

The invention in some respects constitutes an improvement over Hitchcock Patents 1,831,245
15 and 1,831,246, wherein the edge of the original sheet opposite the guide edge is trimmed in order to make it parallel with the guide edge and provide an accurate leading edge for one of the sheet divisions, accurate leading edges being essential
20 for the purpose of maintaining the sheet divisions square for their travel through the balance of the machine and consequently for securing accuracy in the further operations performed upon the sheet divisions.

25 In the Hitchcock patents referred to above, the two sheet divisions are moved laterally away from each other, the original guide edge and the trimmed edge becoming the leading edges of the divisions in their lateral travel. In my invention on the contrary, the slitter formed edges of the divisions of the original sheet become the
30 leading edges in the lateral travel of the sheet divisions and as the slitting knives produce a cut which is absolutely parallel to the original guide edge of the sheet, the slitter formed edges of the
35 sheet divisions are satisfactory both for leading and guide edges.

One of the objects of the invention therefore is the production of a machine in which divisions
40 of an original sheet may be fed through a folding or other paper handling machine accurately and economically through utilization of the slitter or cutter formed edges of said divisions as leading and guide edges.

45 Another object is the provision of a machine of the class described which shall be simple in construction and shall occupy a minimum of floor space.

50 Other objects and features of novelty will appear as I proceed with the description of that embodiment of the invention which, for the purposes of the present application, I have illustrated in the accompanying drawings, in
55 which:—

Fig. 1 is a plan view of a folding machine embodying my invention;

Fig. 2 is a vertical section on a larger scale, the section being taken substantially on the line 2—2 of Fig. 1;

Fig. 3 is a transverse vertical sectional view taken substantially on the line 3—3 of Figs. 1 and 2;

Fig. 4 is a diagrammatic plan view showing driving connections, and

Fig. 5 is a perspective view of a sheet deflector element employed in connection with the invention.

In the drawings the framework of the machine is indicated at 10. It is built preferably in three
15 more or less distinct units, a central unit which carries the primary feed table, a first or primary fold section, and two cross feed tables spaced apart vertically, and two side units each of which carries a cross fold section, a further cross car-
20 rier, a final fold section, and a stacker.

The primary feed table is shown at 11, and comprises a series of diagonally arranged driven rollers 12 and a side guide 13 which is preferably adjustable. An adjustable mounting for the guide
25 is indicated at 14, and it is to be understood that at least one other mounting of the same kind will be utilized, it being possible by means of these mountings to move the side guide bodily toward and away from the edge of the table and to vary
30 its direction in such manner as to insure accurate feeding of the sheet. At the forward end of the feed table 11 there are feed rolls 15 and 16 which direct the sheet through a pair of guide plates 17 and 18 into the first or primary fold section
35 of the machine.

The primary fold section is of the buckle fold type and may be entirely conventional in construction, embodying fold plates 19 and 20 and feeding and folding rolls 21, 22, 23, 24 and 25.
40 It will be understood that in this first fold section of the machine the sheet may have imparted thereto one or more folds in parallel, provision being made, as is usual, for disabling any part or all of the fold plates.

45 When the sheet leaves the primary fold section, it is directed by means of a guide 26 between two slitter shafts 27 and 28 which carry a central pair of slitter knives 29 and one or more additional pairs of slitter knives 30 spaced
50 away from the central pair. In the drawings there are three pairs of knives illustrated, but it is to be understood that this number may be varied to suit the requirements of the particular job in hand, that is to say a central pair only
55

may be used, one or more additional pairs 30 may be used upon either or both sides of the middle pair, or the knives may be removed entirely if no cuts are required. The slit-
 5 27 and 28 also carry pairs of rubber faced wheels 31 which act as feeding rolls. The number and the spacing of these wheels may also be varied to suit conditions.

Somewhat below and somewhat forward of the
 10 slit-ter shafts 27 and 28 I mount a square rod 32 which extends transversely of the central unit of the machine frame and is rigidly secured to the frame members. Upon this rod I mount de-
 15 flector elements 33 each of which, as shown particularly in Fig. 5, comprises an inclined deflecting surface 36 and a pair of clamp plates 37, through one of which extends a clamping screw 38 by means of which the deflector element may be fastened in place upon the rod 32. It will be
 20 understood that these deflector elements may be positioned at any desired points along the length of the rod. On one side of the vertical plane through the middle set of slit-ter knives 29 the deflector elements are mounted on the rod 32 in
 25 the relation shown in Fig. 5. On the other side of that plane the deflector elements are turned over to position the surfaces 36 on top, the clamping plates 37 then straddling the rod 32 and the screw 38 engaging the rear side of that
 30 rod, as indicated in dotted lines in Fig. 2. The deflector elements at the right-hand side of Fig. 1 therefore direct the sheet divisions on that side of the machine downwardly into the grip of a
 35 pair of feed rolls 39, while the deflector elements on the left-hand side of the machine guide the sheet divisions on that side forwardly in a more or less horizontal direction into the grip of a
 40 pair of feed rolls 40. The divisions which pass through the feed rolls 39 strike a deflector plate 41 and are guided thereby into the grip of a further pair of feed rolls 42.

Slightly below the level of feed rolls 40 and
 45 extending transversely of the machine in front of said rolls, there is a cross feed table 43 comprising a series of driven rollers 44 arranged diagonally at a proper angle for the feeding of
 50 sheet divisions toward the right, as viewed in Figs. 1, 3 and 4. Below the table 43 and slightly below the level of feed rolls 42 there is mounted in the machine frame a second cross feed table
 55 45 carrying a series of feed rollers 46 arranged diagonally at a proper angle for the feeding of sheet divisions toward the left, as viewed in Figs. 1, 3, and 4 of the drawings.

On each of the cross feed tables 43 and 45
 60 there will be one or more side guides, depending upon the number of divisions being handled upon such table. These guides are removable and ad-
 65 justable. In the present case, where the original sheet is cut into four divisions, two side guides are provided for each cross feed table. On the
 70 upper table 43 I have shown an outer long guide 47 and an inner short guide 48. The left end of guide 48 stops short of the plane through the left-handed pair of slit-ter knives 29, so as not to interfere with the travel across the table of the sheet division A', see Fig. 1. On the lower
 75 table 45 there are similarly a long outer guide 49 and a shorter inner guide 50. All of these guides may be provided, if desired, with balls 51 loosely mounted in circular openings in flanges of the guides, for the purpose of improving or otherwise affecting the traction of the table rollers on the sheet divisions.

In the right-hand unit of the machine, at

the delivery end of the cross feed table 43, there
 is positioned a cross folding section which may
 comprise fold plates 52, 53 and 54 and feeding
 and folding rolls 55, 56, 57, 58 and 59. These
 rolls and plates are wide enough to receive and
 fold both of the sheet divisions A' and A², and
 as is well known in the art they are adapted to
 make their folds without regard to the timing of
 the sheets. Hence the fact that the sheet di-
 vision A² will reach the fold section slightly in
 10 advance of the sheet division A' is of no moment. When a sheet division is delivered from the fold
 section by the rolls 58 and 59, it is directed by a
 guide plate 60 into feed rolls 61 and delivered by
 those rolls onto a cross carrier 62, having diag-
 15 onal rollers 63 and two sheet guides 64 and 65. The table may also be furnished with a set of
 driven rollers 66 for assisting the travel of the
 sheet division A² crosswise of the table.

The sheet divisions traveling on the lower
 20 cross feed table 45 enter a fold section which may comprise a fold plate 66' and feeding and
 folding rolls 67, 68 and 69. The sheet divisions after passing through this fold section are di-
 25 rected by a guide plate 70 through a pair of feed rolls 71 onto a cross feed table 72 carrying
 diagonal rollers 73 and a set of straight rollers 74 similar to the rollers 66 above referred to. There are sheet guides 75 and 76 on this table
 30 also for stopping the transverse motion and directing the longitudinal motion of the sheet di-
 visions B' and B².

It will be noted that I have illustrated the cross
 fold sections at the left and right-hand sides of
 the machine as of different capacity, that is with
 35 respect to the number of folds which may be im-
 parted, but it should be understood that sections of the same capacity may be employed if desired.

The cross carrier 72 delivers sheet divisions B' and B² in two parallel paths to a further fold
 40 section which may comprise a fold plate 77 to-
 gether with feeding and folding rolls 78, 79 and 80. The sheet divisions after passing through
 this fold section are directed by guide plate 81
 45 through a pair of feed rolls 82 onto a stacker belt 83 driven at slow speed, and from this belt the
 completed divisions or signatures are or may be
 collected upon a tray 84.

At the right-hand side of the machine, the
 sheet divisions delivered by the cross carrier 62
 50 may be caused to pass through a further fold
 section, not shown in detail, but illustrated as
 including feeding and folding rolls 85 and 86. From this fold section the divisions are delivered
 onto a stacker belt 87 and thence onto a tray 88.

While the details of the driving mechanism may
 be varied more or less, I have illustrated diagram-
 55 matically in Fig. 4 the main features of one driv-
 ing system which I consider satisfactory for the
 purpose. In this system two motors 89 and 90
 are employed, partly for the purpose of simplifying the driving connections, and partly for the
 purpose of making it possible to eliminate the
 drive to part of the machine quickly and easily
 when the job in hand does not require the opera-
 65 tion of that part. For the sake of clearness the
 portions of the machine which are driven from
 motor 89 are shown separate from the remain-
 ing portions of the machine.

The rollers 12 of the primary feed table are
 70 shown as driven by an endless belt 91 through a
 shaft 92 and bevel gears 93 and 94, the bevel gear
 94 being fixed upon a shaft 95 which may be a
 continuation of the motor shaft. The belt 91
 engages the lower surfaces of the rollers 12, driv- 75

ing them by friction, as is well known in the art. The first roll 21 of the primary fold section may be driven by bevel gear 96 from a bevel gear 97 fast on shaft 95, and the other rolls of that fold section may be driven by a gear train 98 which also drives the feed rolls and slitter shafts interposed between the first fold section and the cross feed tables.

Attached to one of the gears of the train 98 is a bevel gear 99 meshing with a bevel gear 100 on a short shaft 101 which carries at its opposite end a bevel gear 102 that meshes with a bevel gear 103 on a short shaft for driving an endless belt 104, this belt contacting the lower surfaces of rollers 44 to drive them in a manner well known in the art.

The rolls of the fold section at the delivery end of table 43 are driven through a train of gears 105, one of which may be directly connected with shaft 95. A shaft 106, driven by bevel gearing from shaft 95 may operate, as shown, through bevel gearing to drive an endless belt 107 which contacts against the lower surfaces of rollers 63 to drive the latter. A further shaft 108 is rotated through bevel gearing by shaft 106, and this shaft 108 is operatively connected to endless belt 109 for the driving of rollers 63 and for the rotation of folding rolls 85 and 86.

Motor 90 drives shaft 110, which in turn drives shaft 111, by means of which endless belt 112 is operated to drive rollers 46 in table 45. The fold roll 69 is driven by bevel gearing from shaft 110, and the other rolls of that fold section are operated by a train of spur gears 112'. Rollers 74 of table 72 are driven by a belt 113 from shaft 110 by a short shaft 114 and bevel gears. The shaft 115 extends along one side of the table 72, being driven from shaft 110 by bevel gearing. This shaft operates through bevel gears and a short shaft 116 to drive an endless belt 117 by means of which diagonal rollers 73 are driven. The roll 78 of the final fold section on this side of the machine is also driven by bevel gearing from shaft 115, and the other rolls of this fold section are driven through a gear train 118.

It will be appreciated that some of the elements of the above described driving system have been omitted for the sake of clearness, it being my intention merely to show the more or less essential features of the system.

When the original sheet is to be folded without being separated into divisions, or when two divisions only are required, all of the deflector elements 36, 37 may be set to direct the sheet or the two divisions thereof, as the case may be, onto the upper cross feed table 43. In that event the lower cross feed table and the parts carried by the left-hand frame unit are not required. Hence the motor 90 will be permitted to remain idle, and a corresponding saving in power will be effected. Of course this feature of the invention may be omitted if desired, and the entire mechanism connected together by suitable means for taking driving energy from a single motor, it being necessary in that event merely to provide an operative connection between the shaft 110 and some one of the slitter or feeder shafts located between the first fold section and the cross feed tables.

In Fig. 1 I have shown a shaft 119 supported by suitable means above the left end of table 43, and power driven in the proper direction by any suitable means for this purpose. This shaft is provided with one or more rubber faced wheels 120, which act upon the upper surfaces of the

folded sheet divisions A' for the purpose of assisting their travel across the table and into engagement with the side guide 47.

Operation.—Assuming that it is desired to divide the original sheet into two, three or four divisions, part of which are to go to one cross folder and part to the other, the slitter knives may be arranged as in Fig. 1, it being understood that if two divisions only are required both sets of knives 30 are removed, and that if three divisions only are required one set of knives 30 are removed. If the original sheet is to be cut into two divisions only the short guides 43, 50, 65 and 76 will be removed from the tables 43, 45, 62 and 72. The left-hand sheet division will then be carried onto table 43 against guide 47 and caused to travel toward the right into the right-hand cross folder, while the right-hand sheet division will be carried onto cross feed table 45 up against guide 49, and caused to travel toward the left and into the left-hand cross folder. In both cases the divisions of the original sheet, after passing through the primary fold section, will have their movement stopped by the guides 47 and 49 respectively, the original leading edges or folded edges becoming the guide edges of the divisions for their travel upon the cross feed tables.

The guide edge and leading edge of the original sheet are assumed to be at right angles to each other. The cut made in the sheet by the slitter knives 29 is necessarily parallel to the guide 13 and the side and guide edge of the sheet, and will be exactly at right angles to the leading edge of the original sheet and the folds imparted thereto by the primary fold section, provided the leading and guide edges of the original sheet were square with each other. When the folded sheet divisions strike against the guides 47 and 49 their folded edges become the new guide edges for the lateral travel of the divisions upon the cross feed tables, and the slitter or cutter formed edge of each division becomes its leading and front registering edge. The new guide edge and leading edge of each sheet division are therefore square with each other, and further operations performed upon the sheet divisions will be square with the previous folds. In order that the slitter formed edge in each case may become the leading and front registering edge on the cross feed table, the divisions are preferably fed so as to pass each other in their travel, that is the right-hand division moves to the left and the left-hand division moves to the right.

When the work to be done calls for slitting the original sheet into four divisions, all of the slitter knives 29 and 30 illustrated in the drawings are utilized, and all of the side guides are used. The four sheet divisions are then delivered onto tables 43 and 45, as indicated at A', A², B' and B² in Fig. 1, each cross feed table carrying two sheet divisions either into the right or into the left-hand cross fold sections. The leading edges in every case, it will be observed, are slitter formed edges. After being folded in the cross fold sections, or passed through those sections without folds, as the case may be, the sheet divisions are delivered onto the cross carriers 62 and 72 and the slitter formed edges of the divisions engage the two side guides thereon. The slitter or cutter formed edge of each division then becomes a side registering and guide edge and said divisions are delivered to the final fold sections by the cross carriers 62 and 72 and passed therefrom onto the stacker belts 83 and 87 in separate piles, each pile containing signatures of one kind only.

If three signatures only are printed on the full-sized sheet, one pair of knives 30 is removed. Assuming that the right-hand pair of knives is removed, then the side guides 50 and 76 are also removed. Two signatures then travel over the upper cross feed table 43 and through the balance of the machine illustrated at the right in Fig. 1, while one signature travels over cross feed table 45 and through the balance of the machine illustrated at the left in that figure.

While it will seldom be necessary, it is within the purview of the invention to employ more than three sets of slitter knives, and more than two side guides on some or all of the cross feed tables, the arrangement and operation of the machine when so equipped being readily apparent to those skilled in the art from the foregoing description.

The invention in its broader aspects is susceptible of use upon paper handling machines other than folding machines, although it finds great utility in folding machines and is consequently illustrated herein as applied to a folding machine. Other variations from the described and illustrated structure may be employed. Accordingly, I desire it to be understood that the scope of the invention is to be regarded as defined exclusively by the appended claims rather than by the foregoing description or the accompanying illustrations.

Having thus described my invention, I claim:

1. In a paper handling machine, means for feeding a sheet in a direction substantially at right angles to its leading edge, means for slitting said sheet as it travels in said direction, and means for feeding each division of the slitted sheet thereafter at right angles to its previous direction of travel with the slit edge leading, whereby further operations may be performed upon each sheet division while the division is maintained square with respect to its original direction of travel.

2. In a paper handling machine, a feed table, a side guide therefor, means associated with said table for producing and maintaining travel of a sheet in a direction parallel with said side guide, means for slitting said sheet during its said travel, and means for feeding each division of the slitted sheet thereafter at right angles to its previous direction of travel with the slit edge leading, whereby further operations may be performed upon each sheet division while the division is maintained square with respect to the original guide edge.

3. In a machine for handling paper sheets having leading and guide edges square with each other, means for producing sheet travel in a direction at right angles to the leading edge of the sheet, means for slitting the sheet during said travel, and means for feeding each sheet division of the slitted sheet thereafter at right angles to its previous direction of travel with the slit edge leading, whereby further operations may be performed upon each sheet division while the division is maintained square with respect to its original leading edge.

4. In a paper handling machine, means for feeding a sheet in a direction substantially at right angles to its leading edge, means for slitting said sheet during said travel, and means for causing the left-hand division to travel thereafter laterally toward the right and the right-hand division to travel laterally toward the left, whereby the slit edge of each division will be the leading edge, and whereby further operations may be performed upon each sheet division while the

division is maintained square with respect to its original direction of travel.

5. In a paper handling machine, means for feeding a sheet in a direction substantially at right angles to its leading edge, means for slitting said sheet during said travel, means for causing one sheet division to continue its travel in the same general direction in one plane and the other sheet division to continue to travel in the same general direction in a plane spaced from the first named plane, and means for causing the said divisions thereafter to travel laterally with their slit edges leading, whereby the divisions pass each other.

6. In a paper handling machine, a feed table, a side guide therefor, means associated with said table for producing and maintaining travel of a sheet in a direction parallel with said side guide, means for slitting said sheet during its said travel, a pair of cross feed tables arranged in spaced planes parallel to the plane of said first named feed table, means for directing one of said divisions onto one of said cross feed tables and the other division onto the other of said cross feed tables, said cross feed tables comprising means for producing travel of the sheet divisions laterally in opposite directions with the slit edge of each sheet leading.

7. In a paper handling machine, a feed table, a side guide therefor, means associated with said table for producing and maintaining travel of a sheet in a direction parallel with said side guide, means for slitting said sheet along a plurality of lines during its said travel, means for feeding certain of the divisions of the slitted sheet thereafter in one lateral direction at right angles to their previous direction of travel with slit edges leading, and means for feeding certain other of the sheet divisions in the opposite lateral direction at right angles to their previous direction of travel with slit edges leading.

8. In a paper handling machine, a feed table, a side guide therefor, means associated with said table for producing and maintaining travel of a sheet in a direction parallel with said side guide, means for slitting said sheet in two places during its said travel, a pair of cross feed tables arranged in spaced planes parallel to the plane of said first named table, one of said cross feed tables having two sheet guides running longitudinally of the table, longitudinal sheet guiding means on the other cross feed table, means for directing two sheet divisions onto said first named cross feed table, one division against one side guide and the other division against the other side guide, means for directing the remaining sheet division onto the other cross feed table, and means associated with said cross feed tables for producing sheet travel thereon along said guides with slit edges of the divisions leading.

9. In a folding machine, a primary fold section of the buckle fold type, means associated with said fold section for slitting sheets during their travel, means for feeding each folded division of the slitted sheet thereafter at right angles to its previous direction of travel with the slit edge leading, and two separate fold sections arranged to receive sheets moving in said right angle directions.

10. In a folding machine, a primary fold section of the buckle fold type, means associated with said fold section for slitting sheets during their travel, a pair of cross feed tables in spaced parallel planes, means for directing one of the

folded sheet divisions onto one of said cross feed tables and the other folded sheet division onto the other of said cross feed tables, said cross feed tables comprising means for feeding the sheet divisions in oppositely directed paths at right angles to the direction of movement of the original sheet through said primary fold section, the slit edges of the sheet divisions leading, and separate fold sections each arranged to receive sheets moving upon one of said cross feed tables.

11. In a paper handling machine, means for causing the travel of a sheet in a given direction, means for slitting the sheet during its said travel, a pair of horizontal cross feed tables spaced apart vertically and arranged to receive the divisions of said slitted sheet, adjustable deflectors adapted to be arranged to direct the sheet divisions onto one of said tables or to direct them separately one onto one table and the other onto the other table, said cross feed tables comprising sheet division moving means working in opposite directions and at right angles to the previous direction of movement of the sheet divisions.

12. In a machine of the class described, means for imparting folds to paper sheets, means associated with said folding means for cutting each sheet into a plurality of divisions, a pair of oppositely working cross feed tables for receiving said divisions one on each table and for causing one of them to move in a path laterally in one direction with its slit edge leading and for causing the other to move laterally in a path in the opposite direction with its slit edge leading, and a fold section in each of said paths for cross folding one at a time all of the divisions traversing that path.

13. In a machine of the character described, means for feeding sheet material, means for slitting or cutting the sheet material along one or more lines parallel with a side and guide edge thereof, mechanism for acting on the divisions of the slit or cut material, and means for feeding the divisions thereto and converting the slitter or cutter formed edge of each of the same into a leading and front registering edge prior to action of said mechanism on said divisions.

14. In a machine of the character described, means for feeding sheet material, means for slitting or cutting the sheet material in a direction parallel with a side and guide edge thereof, mechanism for acting on the divisions of the slit or cut material, and means for feeding the divisions thereto and converting the slitter or cutter formed edge of each of the same into a side registering and guide edge prior to action of said mechanism on said divisions.

15. In a machine of the character described, means for feeding sheet material, means for slitting or cutting the sheet material along one or more lines parallel with a side and guide edge thereof, mechanism for acting on the divisions of the slit or cut material, means for feeding the divisions thereto and converting the slitter or cutter formed edge of each of the same into a leading and front registering edge prior to action of said mechanism on the divisions, mechanism for further acting on the divisions, and means for feeding the divisions thereto and converting said last named edge of each of the same into a side registering and guide edge prior to action of said last named mechanism on said divisions.

16. In a machine of the character described, means for feeding sheet material, means for slitting or cutting the sheet material parallel with a side and guide edge thereof, mechanism for folding the divisions of the slit or cut material, and

means for feeding the divisions thereto and converting the slitter or cutter formed edge of each of the same into a leading and front registering edge prior to action of said folding mechanism on said divisions.

17. In a machine of the character described, means for feeding sheet material, means for slitting or cutting the sheet material along one or more lines parallel with a side and guide edge thereof, mechanism for folding the divisions of the slit or cut material, and means for feeding the divisions thereto and converting the slitter or cutter formed edge of each of the same into a side registering and guide edge prior to action of said folding mechanism on said divisions.

18. In a machine of the character described, means for feeding sheet material, means for slitting or cutting the sheet material parallel with a side and guide edge thereof, mechanism for folding the divisions of the slit or cut material, means for feeding the divisions thereto and converting the slitter or cutter formed edge of each of the same into a leading and front registering edge prior to action of said folding mechanism on the divisions, mechanism for again folding the divisions, and means for feeding the divisions thereto and converting said last named edge of each of the same into a side registering and guide edge prior to action of last named folding mechanism on said divisions.

19. The method of acting on sheet material, which consists in feeding and slitting or cutting the same along one or more lines parallel with a side and guide edge thereof to form divisions of said material, and feeding the divisions and converting the slitter or cutter formed edge of each of the same into a leading and front registering edge prior to a further action on said divisions.

20. The method of acting on sheet material, which consists in feeding and slitting or cutting the same in a direction parallel with a side and guide edge thereof to form divisions of said material, and feeding the divisions and converting the slitter or cutter formed edge of each of the same into a side registering and guide edge prior to a further action on said divisions.

21. The method of acting on sheet material, which consists in feeding and slitting or cutting the same in a direction parallel with a side and guide edge thereof to form divisions of said material, feeding the divisions and converting the slitter or cutter formed edge of each of the same into a leading and front registering edge, further acting on the divisions, feeding the divisions and converting said last named edge of each of the same into a side registering and guide edge, and again acting on said divisions.

22. The method of acting on sheet material, which consists in feeding and slitting or cutting the same in a direction parallel with a side and guide edge thereof to form divisions of said material, feeding the divisions and converting the slitter or cutter formed edge of each of the same into a leading and front registering edge, and folding said divisions.

23. The method of acting on sheet material, which consists in feeding and slitting or cutting the same in a direction parallel with a side and guide edge thereof to form divisions of said material, feeding the divisions and converting the slitter or cutter formed edge of each of the same into a side registering and guide edge, and folding said divisions.

24. The method of acting on sheet material, which consists in feeding and slitting or cutting

the same in a direction parallel with a side and guide edge thereof to form divisions of said material, feeding the divisions and converting the slit-
5 ter or cutter formed edge of each of the same into a leading and front registering edge, folding the divisions, feeding the divisions and converting said last named edge of each of the same into a side registering and guide edge, and cross
10 folding said divisions.
25. The method of acting on sheet material, which consists in feeding the material and utilizing a side edge thereof for guiding and registering purposes, folding the material, slitting or
15 cutting the folded material along one or more lines parallel with said edge to form folded divisions of said material, feeding the folded divisions and converting the slit-
ter or cutter formed

edge of each of the same into a leading and front registering edge, and cross folding said divisions.

26. The method of acting on sheet material, which consists in feeding the material and utilizing
5 a side edge thereof for guiding and registering purposes, folding the material transversely thereof, slitting or cutting the folded material along one or more lines parallel with said edge to form folded divisions of said material, feeding
10 the folded divisions and converting the slit-ter or cutter formed edge of each of the same into a leading and front registering edge, cross folding the divisions, further feeding the divisions and converting said last named edge of each of the
15 same into a side registering and guide edge, and again cross folding said divisions.

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