No. 897,933. PATENTED SEPT. 8, 1908.

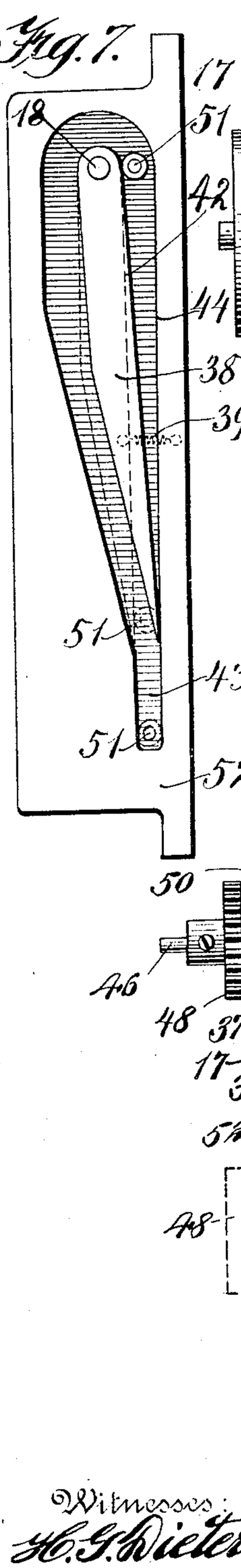
E. P. SAYRE.

LABELING MACHINE.

APPLICATION FILED AUG. 23, 1907.

4 SHEETS—SHEET 1.

Fig. 7.



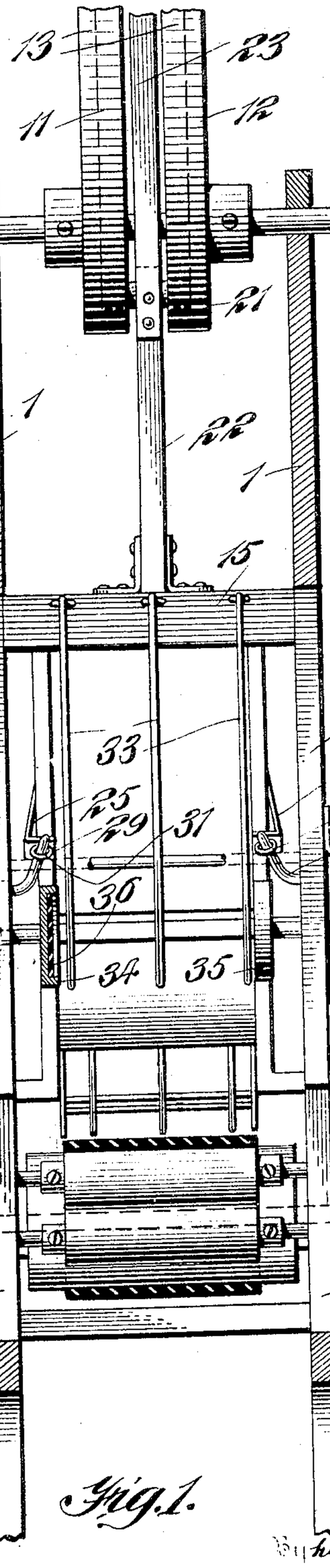


Fig. 8.

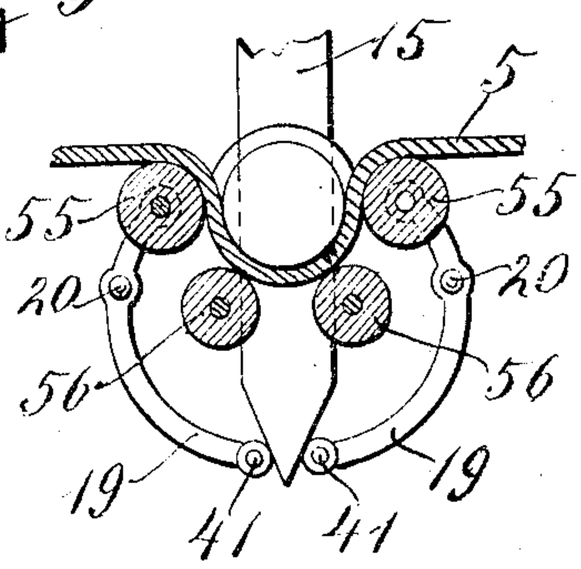


Fig. 1.

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4 SHEETS—SHEET 2.

Fig. 2.

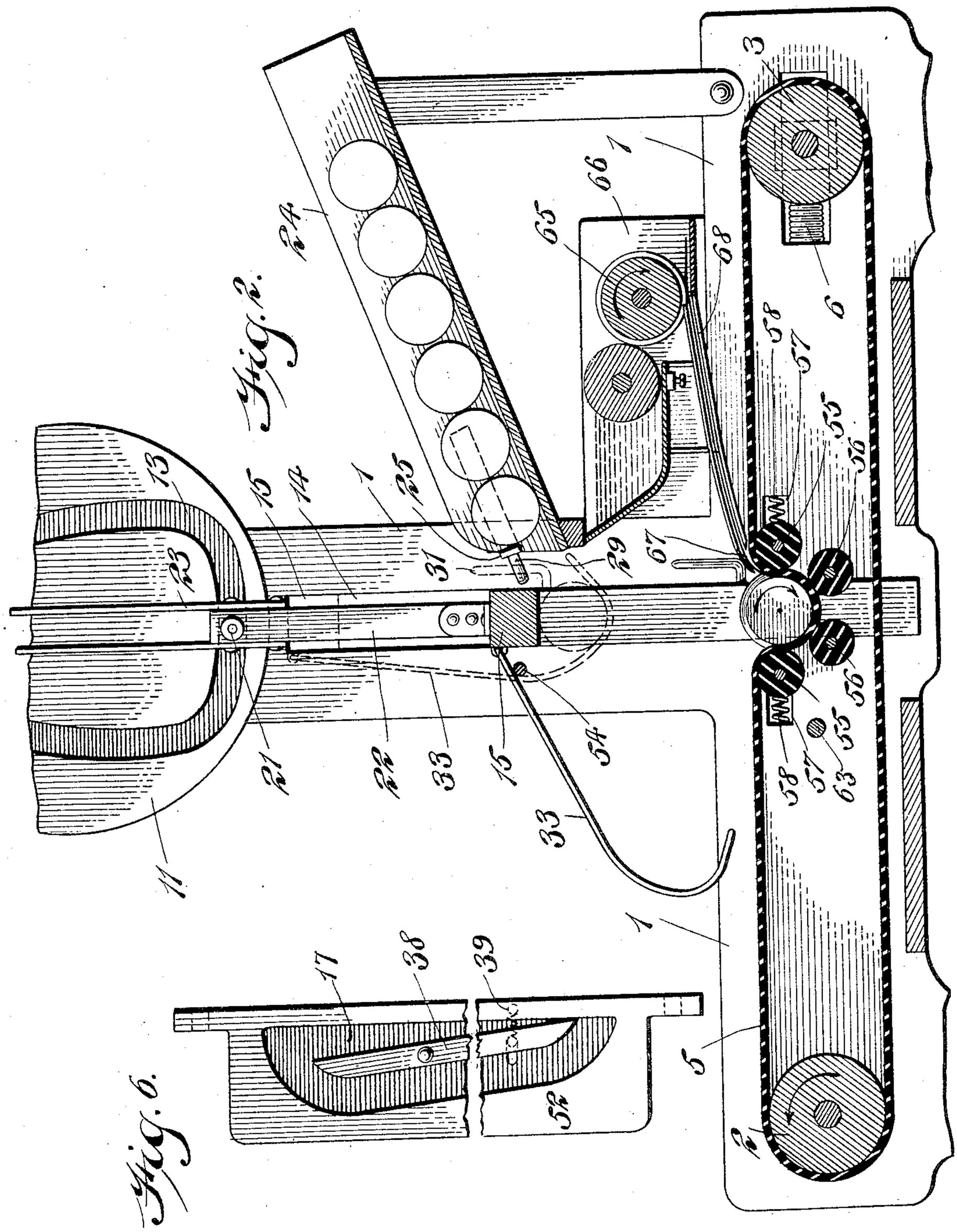

Fig. 6.

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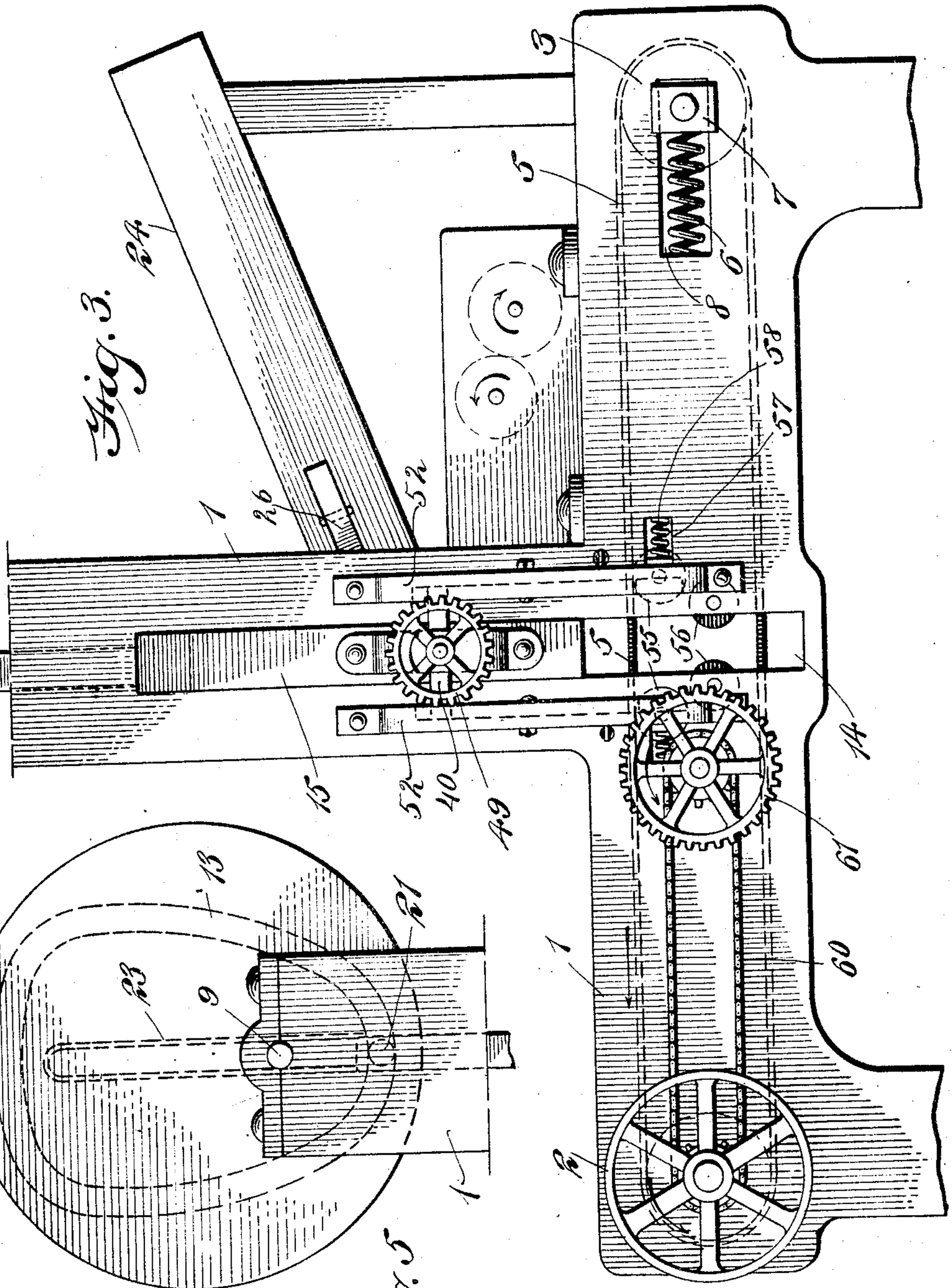
4 SHEETS—SHEET 3.



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4 SHEETS—SHEET 4.

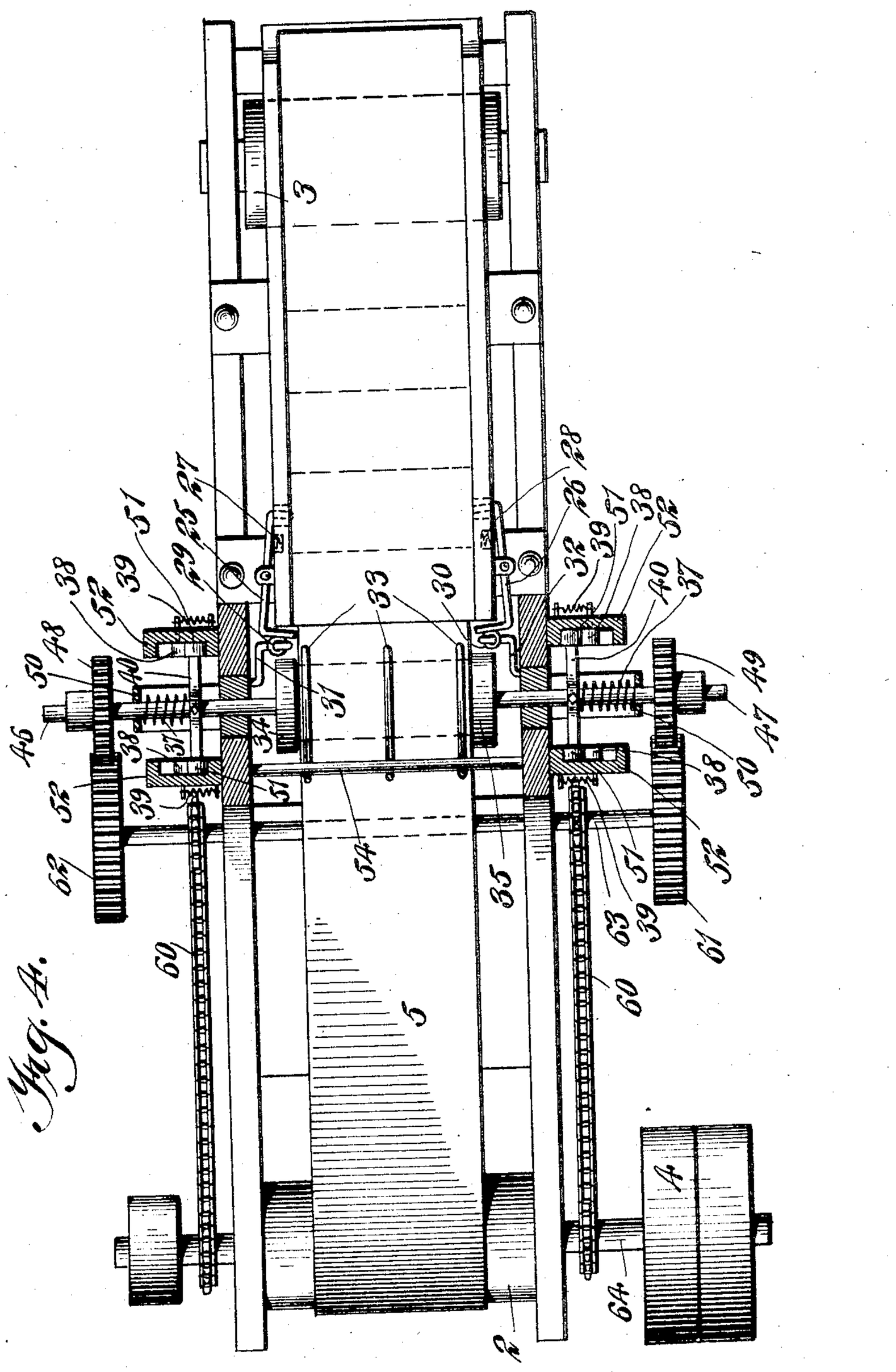

Fig. 4.

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UNITED STATES PATENT OFFICE.

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LABELING-MACHINE.

No. 897,933. Specification of Letters Patent. Patented Sept. 8, 1908.

Application filed August 23, 1907. Serial No. 389,779.

To all whom it may concern:

Be it known that I, EDWARD P. SAYRE, a citizen of the United States of America, and a resident of Montclair, Essex county, State of New Jersey, have invented certain new and useful Improvements in Labeling-Machines; of which the following is a full and clear description.

It is well known that difficulty is encountered in labeling the full width of the surface of cylindrical tin cans having protruding rims on their surface caused by the overlapping bottom and cover of the can. The means heretofore used in machines of this kind are insufficient to press the label tight enough on to the kind of cans above mentioned throughout the whole width of the cylindrical surface, to cause the label to stick properly to the can.

My invention refers to an improvement for this particular purpose, which may, however, also be employed in any labeling machine, and I shall therefore claim in particular only the device which applies the labels to the can. The devices for supplying the cans to the labeling device and for applying the paste to the labels are merely shown as representing one of the many devices which may be employed for this purpose and do not represent part of my invention.

In the accompanying drawings: Figure 1 is a front view of the machine. Fig. 2 is a side view of the machine, one side of the frame being removed. Fig. 3 is a full side view of the machine. Fig. 4 is a plan view of the machine. Fig. 5 is a detail view of one of the cam disks which operates the device, feeding the cans singly to the labeling mechanism. Fig. 6 is a detail view of the device causing the gripper disks to open and close, shown in larger scale. Fig. 7 is a detail view of the same device showing a modification and preferred form. Fig. 8 is a modified form of the arrangement of the roller holding the can during the labeling process.

In Figs. 1, 2 and 3, 1 is the main frame of the machine consisting of two parallel sides mutually braced to each other. Between these sides are mounted two rollers 2 and 3 over which a belt 5 of elastic material of any suitable kind, such as for instance rubber, is led and held under tension by means of expansion springs 6 (only one shown in Figs. 2 and 3) abutting against bearings 7 of roller 3, which are for this purpose slidingly disposed in slots 8 of frame 1. In the upper end of the vertical arm of frame 1 is journaled shaft 9 on which are fastened driving pulley 10 and cam disks 11 and 12, in each of which disks a cam groove 13 is provided, both grooves being of the same shape. In the vertical arm of frame 1 is further provided a vertical slot 14 of suitable length to allow reciprocating frame 15 as much vertical motion as required. This reciprocating motion is imparted to frame 15 by pin 21 gliding in cam grooves 13 of disks 11 and 12 and fastened to the upper end of an arm 22 which in turn is fixed at its lower end on frame 15. Arm 22 is besides guided vertically by having shaft 9 pass through guide yoke 23 fixed at its upper end (Figs. 1, 2, 5). It will now be seen that owing to the eccentrical position of grooves 13 relatively to shaft 9, a vertical reciprocating motion will be imparted to frame 15.

Transversely to frame 15 is disposed can chute 24 and fastened to the main frame 1 at a suitable incline to cause cans supplied to this chute to roll towards frame 15. Normally the cans are prevented from rolling out of the chute by means of two locks 25 and 26 (Fig. 4), one pivoted on each side wall of the chute at its lower end and held by springs 27 and 28 respectively in a position in which the hook shaped outer ends of these locks will protrude into the path of the can which is at the end of the chute, thus preventing it from rolling out. At these outer ends of locks 25 and 26 are fastened the eyes 29 and 30 respectively which are disposed to be engaged by fingers 31 and 32 respectively fastened to frame 15, when the locks are in the position described above. If now frame 15 is in its reciprocating motion on its upward stroke, it will be seen that locks 25 and 26 after their eyes have been engaged by their fingers, will perform an outward motion owing to the slanting direction in which fingers 31 and 32 run (Fig. 1) relatively to the vertical axis of the machine. This will remove the hook-shaped outer ends of locks 25 and 26 from the path of the can at the end and render same free to drop out. In this latter position the locks are shown in Figs. 1 and 4.

On the upper cross bar of frame 15 are pivoted three carriers 33 which hang in the position indicated by dotted lines in Fig. 2 when frame 15 is in its highest position also indicated by dotted lines (in Fig. 1 in full lines) in which position the fingers 31 and 32 have withdrawn their respective locks 25 and 26 as described above. If now a can thus

freed rolls out of chute 24 it will drop into the hook-shaped lower ends of carriers 33 (Fig. 2 in dotted lines), by which it is held until it is received between the gripper disks to be described later on.

When the hook-shaped outer ends of locks 25 and 26 release a can at the end of the chute by their outward motion, the inner, also hook-shaped, ends of locks 25 and 26 will perform an inward motion by which the next can will be locked and prevented from following the first can when same is rolling out of the chute. Only after frame 15 has started on its down stroke and the outer hooks of locks 25 and 26 have closed the end of the chute this second can will be freed and will roll to the end of the chute where it is held by the locks as described above.

In the vertical arms of frame 15 are suitably journaled shafts 46 and 47, both in line with each other, which shafts carry fastened at their inner ends, protruding into frame 15, gripper disks 34 and 35 respectively, and fastened to their outer ends gear wheels 48 and 49 respectively. Each of the shafts 46 and 47 has loosely secured to it cross-arm 40, at the end of which are provided rollers 51 (Figs. 1 and 4) which are normally tending to engage with the straight surface of guides 52 fastened on frame 1 by springs 37 abutting with one end against cross-arms 40 and with the other end against a U-shaped yoke 50 fastened on each side of frame 15 which serve at the same time as further support for shafts 46 and 47. Within the recess 17 of each roller guide 52 is pivoted a lever 38, which is held in position shown in Fig. 1 and in detail in Fig. 6 by means of tension spring 39. The recessed inner surface of each gripper disk 34 and 35 is provided with a lining of yielding material such as, for instance, rubber or the like, as shown at 36 in Fig. 1.

Assuming now that a can is in the position shown in dotted lines in Fig. 2 and held by carriers 33, at which time frame 15 is drawn to its highest position so that disks 34 and 35 are each opposite one end of this can and that disks 34 and 35 have been drawn apart and released again, so that this can is held between these disks by means of springs 37. If now in operating shaft 9, cam disks 11 and 12 cause frame 15 to descend, the can will be carried along between gripper disks 34 and 35, whereby rollers 39 follow the straight portion of the recess of guides 52 (Fig. 1). The dimensions of the structure are chosen so that the rollers 51 are not in contact with above mentioned straight surface so that disks 35 and 36 will bear with the full power of spring 37 against the can. Carriers 33 are disposed so that they rest in the position indicated by dotted lines (Fig. 2) against a rod 54 fastened on frame 1 in parallel to frame 15. If now frame 15 descends as described above, carriers 33 will assume the position shown in Fig. 2 in full lines and thus be removed from the downward path of the can.

Within main frame 1 are further disposed two pairs of rollers 55 and 56 symmetrically to the middle line of the path of frame 15, as shown in Figs. 2 and 3, and furthermore pair 55 is disposed so relatively to belt 5 that these rollers form normally a support for belt 5 (Fig. 3). The bearings of roller pair 55 are disposed similarly to bearing 7 of roller 3, that is to say, horizontally slidingly in slots 57 provided in frame 1 and held yieldingly against the ends of these slots pointing toward each other by springs 58. The two pairs of rollers are disposed relatively to each other so that they will encircle the lower half of a can when brought into the position shown in Fig. 2, preferably so that the center of the can is slightly beneath the line connecting the center of roller pair 55. Both pairs of rollers are heavily lined with yielding material preferably rubber, so that if a can held between gripper disks 34 and 35 is carried downward on the downward stroke of frame 15 the can may be forced between the four rollers with belt 5 between the can and the rollers. When the can is in this position, gear wheels 48 and 49 fastened to shafts 46 and 47 respectively have come in mesh with gear wheels 61 and 62 respectively, which are both fastened to shaft 63, which in turn is driven by chains 60 from shaft 64 on which roller 2 is mounted the gearing to wheels 48 and 49 being such that the can will be driven by its gripper disks at the same speed as it is driven by belt 5. The labels are pasted by roller 65 suitably mounted in the paste-applying device, description of which and of the label holding and feeding devices is omitted since these kinds of devices are well known and any of these devices may serve the purpose. From the paste applying device the labels are fed to the can between the roller pairs 55 and 56, through guide 68, through which they may be led or forced in any well known manner.

The manner in which the labeling devices operate is as follows: After a can has been released from the chute by the upward stroke of frame 15 in the manner described above, and been received by the carriers 33, rolls 51, which have traveled during the upward stroke of frame 15 on the outside of their respective inclined levers 38 will roll from their levers towards the straight surface of the recess 17 of guide 52, causing the gripper disks 34 and 35 to close upon the two ends of the can held by the carriers. During this period roll 21 disposed in groove 13 travels through the portion of these grooves in which it is shown in Fig. 5, which runs for a suitable distance circular relatively to shaft 9 so that it will cause frame 15 to remain a sufficient time in this uppermost por-

tion to allow gripper disks 34 and 35 to close upon the can as described above. Frame 15 commences then its downward stroke, thereby removing carrier 33 from underneath the can, as also described above. Upon the arrival of the can on belt 5 the can will be forced with the belt between the roller pairs 55 and 56, spring 6 yielding sufficient so that no undue strain is thereby put upon belt 5. Gear wheels 48 and 49 now in mesh with gear wheels 61 and 62 respectively will revolve the can, during which period the label runs between the can and belt 5, the yielding material of the belt and the rollers pressing the label snug onto the whole cylindrical surface of the can in spite of the protruding rims of the overlapping cover and bottom of the can. During this period roll 21 of arm 22 travels through the portion of grooves 13 in which it is shown in Fig. 2, which portion as may be seen, is circular, relatively to the shaft on which cam disks 11 and 12 revolve, so that during this period frame 15 will stay somewhat longer in its lowermost position in which the can is labeled. In this position rolls 51 on gripper disk-shafts 46 and 47 are in the position indicated by dotted circles in Fig. 1, these rolls having traveled during the downward stroke in the direction of the straight surface of the recess 17 of guides 52. On the upward stroke of frame 15 these rolls will travel on the outside of their respective levers 38 which are held in the position shown in Fig. 1 by means of springs 39 (Fig. 6) as described above, which will cause gripper disks 34 and 35 to open and let go the can, which will be thrown out of its seat between the roller pairs 55 and 56 by the elasticity of belt 5 and spring 6, and may be received by any suitable device not shown in the drawings. During the whole upward stroke, while rolls 51 roll on the outside of levers 38, the gripper disks will stay apart sufficient to allow the next can released from the chute and caught in the meantime by carriers 33 to pass between, whereafter on rolling of rolls 51 from the upper ends of levers 38 towards the straight surface of recess 17 the gripper disks will close upon this can by means of the action of their expansion springs 37 as described above, so that the device is ready to carry this down to the labeling device, and so on.

While I have shown and described a particular device for supplying the cans to the labeling device, I do not wish to limit myself to this particular device, since various structures may serve the same purpose, the spirit of my invention being the affixing of the labels to cans having an uneven cylindrical surface by yielding means, causing the label thus pasted to stick to the can throughout the whole surface. Other modifications of my invention within its scope will be apparent. For example, the receiving pocket for taking and applying the label to the can, comprising the four rolls 55, 56, may in some cases operate directly on the can, the belt 5 being omitted from the structure. But the belt is desirable by reason of its close and distributed pressure upon the surface of the can and label.

The form and arrangement of lever 38 disposed in recess 17 of guide 52 as shown in Figs. 1 and 6 is a rather simple and crude manner in which the gripper disks are operated. The preferred form of the device operating the clamping or gripper disks as actually used is shown in Fig. 7. As may be seen from this figure roll 51 starting on its down stroke will be gradually forced toward surface 44 of recess 17 owing to the surface 42 of lever 38, when in the position shown in dotted lines, gradually tapering toward surface 44 in the downward direction. The groove formed by these two surfaces may also extend further down into guide 52 forming a groove 43 with parallel sides, roll 51 moving on its down stroke to the bottom of the groove. This groove 43 which runs in parallel to the movement of frame 15 serves for causing the gripper disks to hold the can positively without aid of springs 37 the tightest while it is forced between the labeling roll and to also hold the can tight while it is drawn out of the labeling roll, thus aiding the ejecting tendency of belt 5. Roll 51 is shown in Fig. 7 in its lowermost position in dotted lines. When roll 51 has passed the tongue of lever 38 spring 39 will draw lever 38 into the position shown in full lines so that on the upstroke roll 51 will roll on the outside of lever 38 which will cause the gripper disks to open in the manner already described. Furthermore also the manner in which the roller pair 55 is disposed in frame 1 as shown in Fig. 2 is mere diagrammatical. While in this structure described above and shown in Fig. 2 this roller pair is forced towards the can by means of springs 58, the preferred form in actual use is shown in Fig. 8. As may be seen from this figure, the roller pair 55 is journaled in the curved levers 19, suitably pivoted in frame 1 by pivots 20. The lower ends of levers 19 are curved towards the vertical line in which frame 15 reciprocates and provided at their ends with rolls 41. Both vertical bars of frame 15 are pointed at their lower ends so that they will be forced between rolls 41 on descending of frame 15 causing the lower arms of lever 19 to spread and thus rollers 55 to close positively upon the can which has been conveyed at that time into the pocket formed by roller pairs 55 and 56. This will cause rollers 55 to close upon the can only when same is in pocket while on the up-stroke of frame 15 these rollers will loosen their grip immediately.

This labeling device may of course be

easily adapted to various sizes of cans by either changing the size of roller pairs 55 and 56 or shifting their centers so that they may form a pocket of larger or smaller size as required by the diameter of the can, but this modification is not shown in the drawings since it is obvious that this may be obtained by any of the constructions well known in mechanics.

I claim:

1. In a machine for labeling cans, the combination with means for supplying cans and means for supplying paste and labels; of positively driven yielding means adapted to form a pocket to receive the can and press the label supply to the surface to be labeled and means adapted to positively force said cans towards said yielding means, causing said cans to form said pocket.

2. In a machine of the character described, the combination with means for supplying cans and means for supplying paste and labels; of a flexible endless belt normally held straight in stretched condition, rollers disposed underneath said belt and adapted to receive the can with the belt between and press the label supplied to the surface to be labeled, and means adapted to force said cans between said rollers with said belt between.

3. In a machine of the character described, the combination with means for supplying cans and means for supplying paste and labels; of a flexible endless belt normally held straight in stretched condition, yielding rollers disposed underneath said belt and adapted to receive the can with the belt between and press the label supplied to the surface to be labeled, and means adapted to force said cans between said rollers with said belt between.

4. In a machine of the character described, the combination with means for supplying cans and means for supplying paste and labels; of a flexible endless belt normally held straight in stretched condition, yielding rollers semi-circularly disposed underneath said belt adapted to receive the can and press the label supplied to the surface to be labeled and means adapted to force said cans between said rollers with said belt between.

5. In a machine of the character described, the combination with means for supplying cans, and means for supplying paste and labels; of a flexible endless belt yieldingly disposed normally held straight in stretched condition, yielding rollers semicircularly disposed underneath said belt adapted to receive the can and press the label supplied to the surface to be labeled and means adapted to force said can between said rollers with said belt between.

6. In a machine of the character described, the combination with means for supplying cans, and means for supplying paste and labels; of a flexible endless belt yieldingly disposed and normally held straight in stretched condition, yielding rollers semicircularly disposed underneath said belt adapted to receive the can and press the label supplied to the surface to be labeled and means adapted to force said can between said rollers with said belt between and hold the can during the labeling process.

7. In a machine of the character described, the combination with means for supplying cans, and means for supplying paste-coated labels; of a flexible endless belt yieldingly disposed, yielding rollers semicircularly disposed underneath said belt adapted to receive the can and press the label applied to the surface to be labeled, and a frame reciprocatingly disposed adapted to receive and hold a can from said supplying means, adapted to force a can thus received between said rollers with said belt between and hold it during the labeling process and means on said frame causing the release of the can after the labeling process.

8. In a machine of the character described, the combination with means for supplying cans, and means for supplying paste-coated labels; of a flexible endless belt yieldingly disposed, yielding rollers semicircularly disposed underneath said belt adapted to receive the can and press the label applied to the surface to be labeled, and a frame reciprocatingly disposed having gripping means suitably operated to receive and hold a can from said supplying means, means for operating said frame causing it to force said can between said rollers with said belt between and holding it during the labeling process, and gripping means disposed to impart rotating motion to said can while between said rollers and means causing said gripping means to release the can after the labeling process.

9. In a machine of the character described, the combination with means for supplying cans, and means for supplying paste-coated labels; of a flexible endless belt yieldingly disposed, yielding rollers semicircularly disposed underneath said belt adapted to receive the can and press the label applied to the surface to be labeled, and a frame reciprocatingly disposed having two gripper disks suitably operated to receive and hold a can from said supplying means, means for operating said frame causing it to force said can between said rollers with said belt between and holding it during the labeling process, said gripper disks disposed to impart rotating motion to said can while between said rollers and means causing said gripper disks to release the can after the labeling process.

10. In a machine of the character described, the combination of label affixing means, means for clamping a can, means for carrying said clamping means to the label

affixing means, means for causing said clamping means to gradually tighten their grip positively while carried to said labeling means and to positively grip the tightest while coöperating with said labeling means and to loosen their grip when removed from said labeling means and means for holding the clamping means from reciprocation while the label is being affixed.

11. In a machine of the character described, the combination of clamping means for holding a can, label affixing means comprising yielding rollers arranged to form a pocket adapted to close upon a can and means carrying said clamping means to said affixing means, said carrying means adapted to cause said pocket to close upon a can when conveyed thereto and held therein by said clamping means.

12. In a machine of the character described, the combination of label affixing means comprising yielding rollers arranged to form a pocket adapted to close upon a can, means for clamping a can, means for carrying said clamping means to said pocket, means for causing said clamping means to gradually and positively tighten their grip on approaching said pocket and to positively grip the tightest when coöperating with said pocket, said carrying means disposed to cause said pocket to close upon a can when conveyed thereto and positively held therein by said clamping means.

13. In a machine of the character described, the combination of label affixing means comprising yielding rollers arranged to form a pocket adapted to close upon a can, means for clamping a can, means for carrying said clamping means to said pocket, means for causing said clamping means to gradually and positively tighten their grip on approaching said pocket and to positively grip the tightest when coöperating with said pocket, said carrying means disposed to cause said pocket to close upon a can when conveyed thereto and positively held therein by said clamping means, and means for rotating the clamping means while the label is being affixed.

14. In a machine of the character described, the combination of label affixing means, comprising yielding rollers arranged to form a pocket and reciprocating can clamping means for carrying successive cans to said label affixing means, and for positively holding said cans within said affixing means, while said labels are affixed.

15. In a machine of the character described, the combination of label affixing means, comprising yielding rollers arranged to form a pocket, means for positively clamping and holding a can, reciprocating means for carrying said clamping means to the label affixing means and causing same to force said cans into said pocket, and means for holding the clamping means from reciprocation, while the label is being affixed.

16. In a machine of the character described, the combination of label affixing means, means for positively clamping and holding a can, means for feeding cans to the clamping means, means for reciprocating the clamping means from the feeding means to the label affixing means, means for holding the clamping means from reciprocation while the label is being affixed and means for rotating the clamping means while the label is being affixed.

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