Sept. 29, 1953 P. C. ROBINSON 2,653,431

BAG BALING MACHINE

Filed Sept. 28, 1950 3 Sheets-Sheet 1

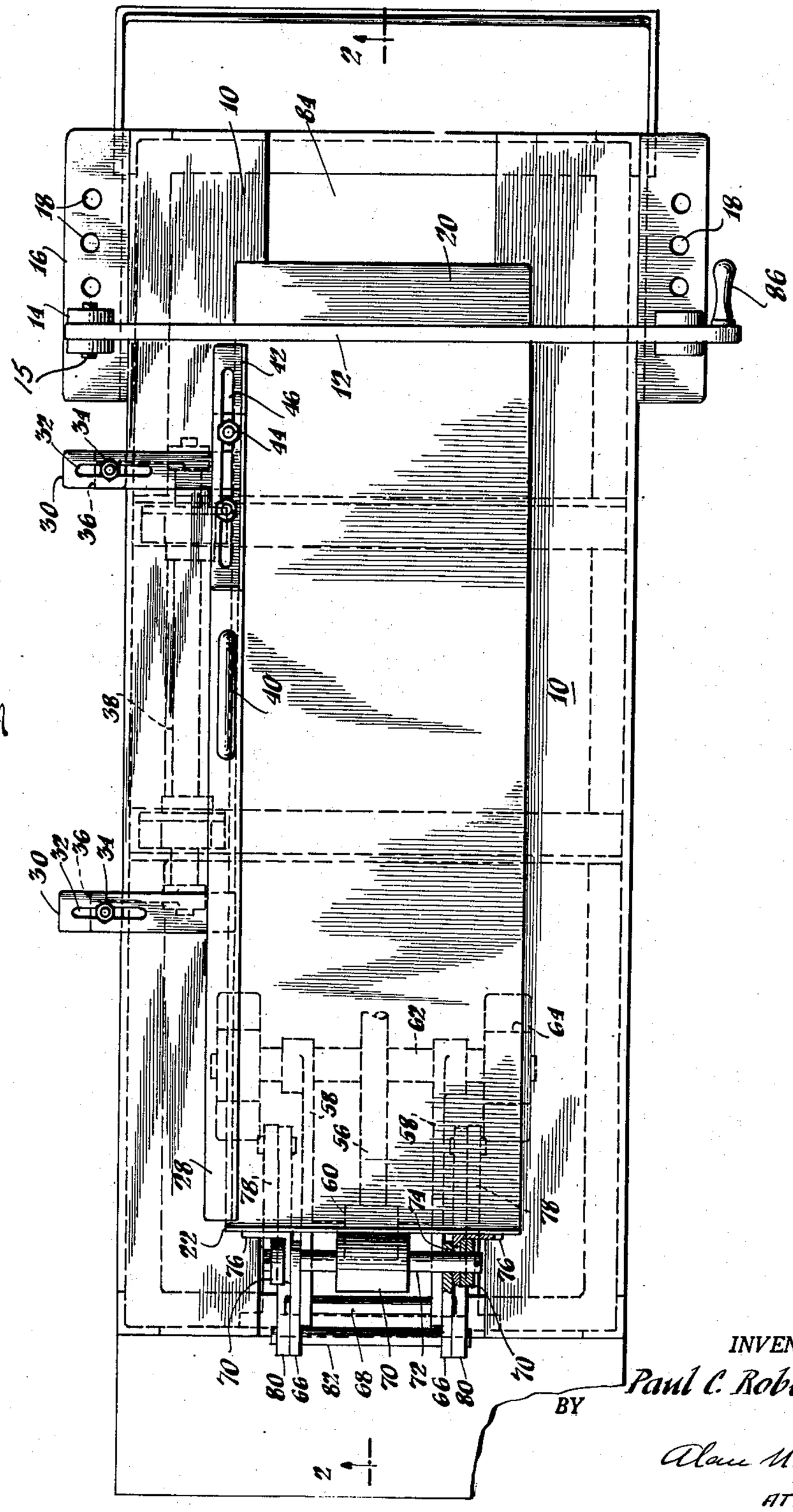

Fig. 1

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BAG BALING MACHINE

Filed Sept. 28, 1950 3 Sheets-Sheet 2

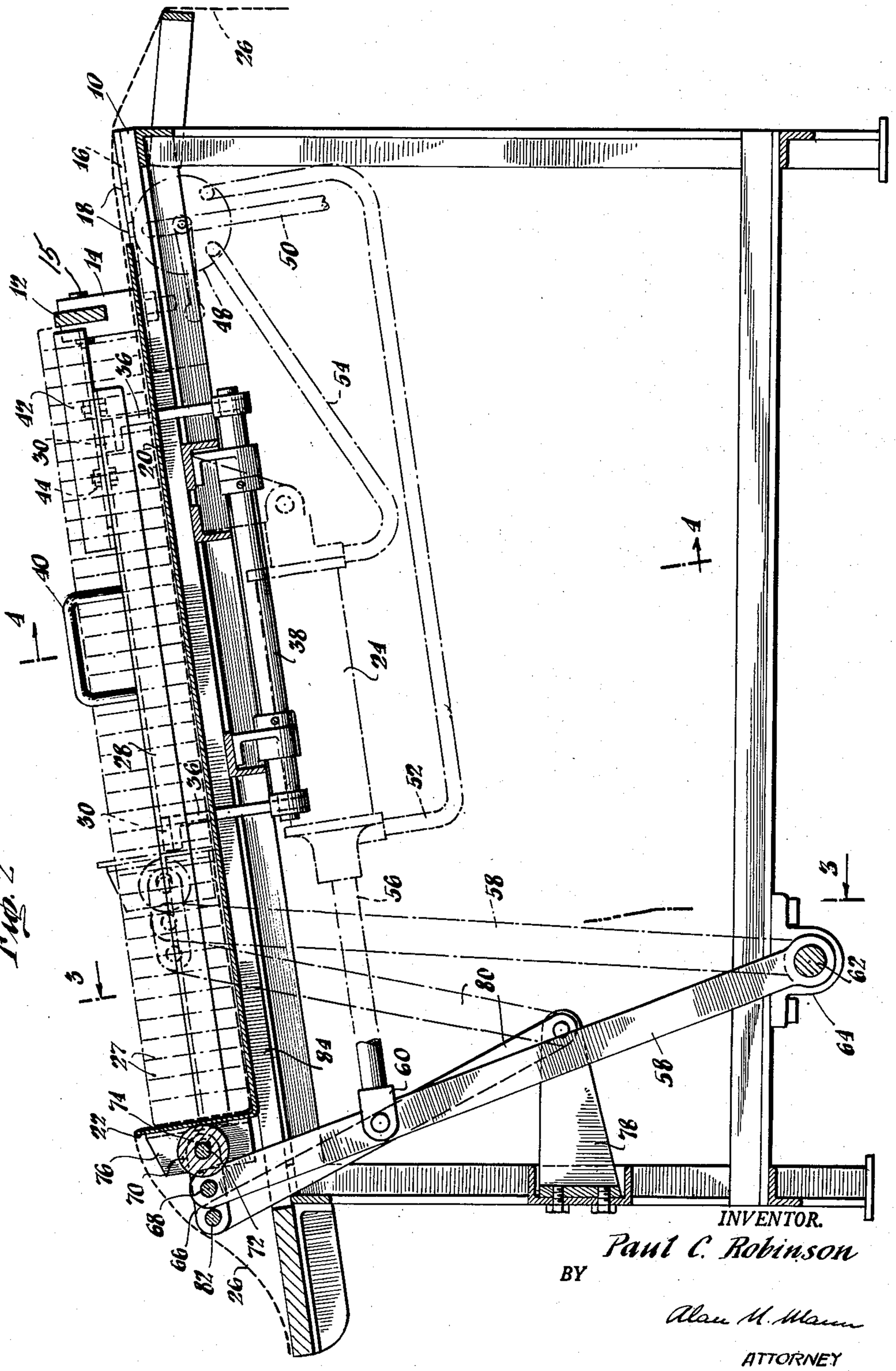

Fig. 2

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Sept. 29, 1953 P. C. ROBINSON 2,653,431

BAG BALING MACHINE

Filed Sept. 28, 1950 3 Sheets-Sheet 3

Fig. 4

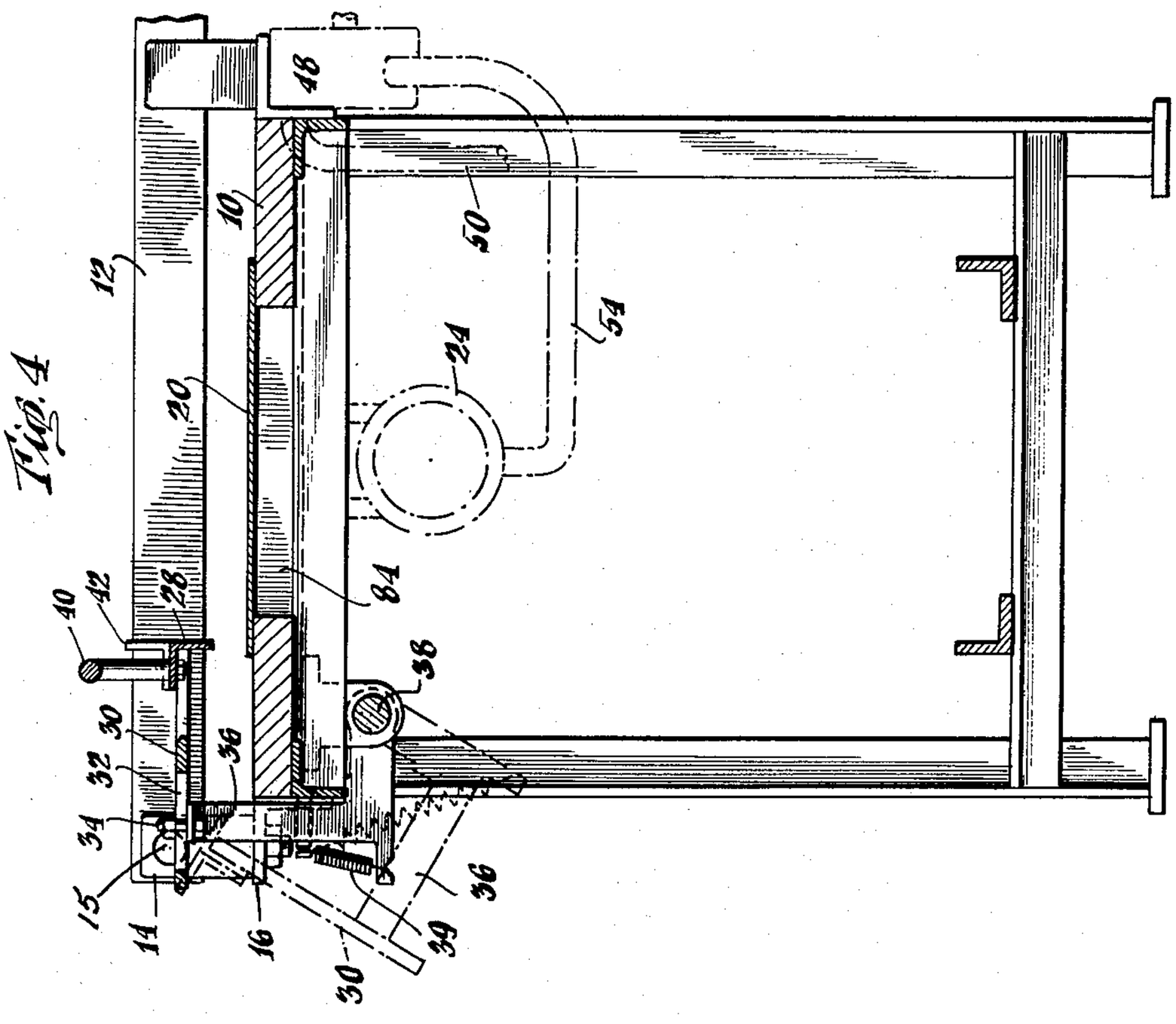
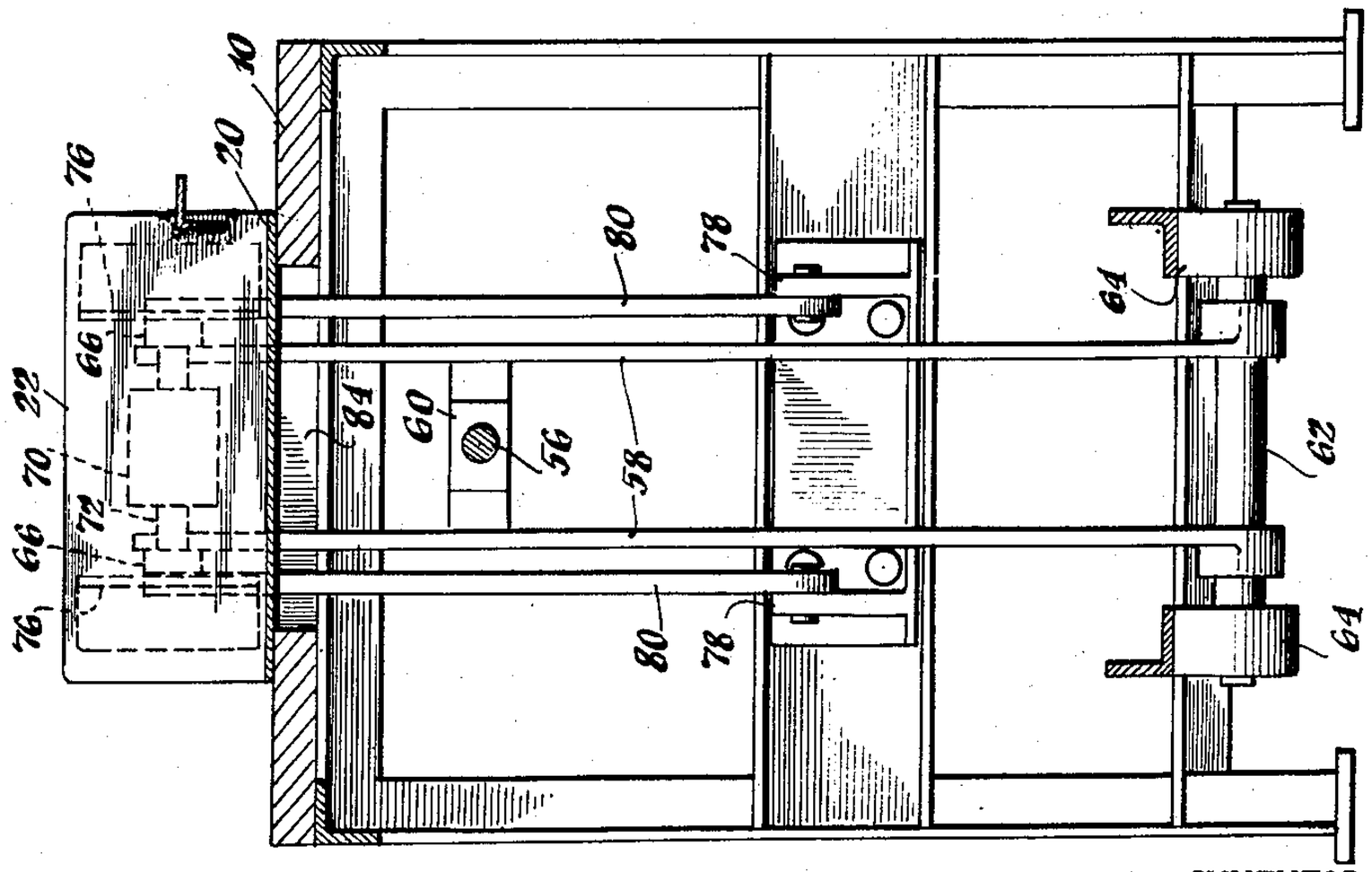


Fig. 3



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BAG BALING MACHINE

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6 Claims. (Cl. 53—57)

1

This invention relates to an improved baling machine used for packaging a stack of paper bags or the like. This device compresses the bags into an exceptionally tight package for shipment.

The great convenience of my device is that the bags may be quickly and accurately positioned on a sheet of wrapping paper held between a fixed plate and a movable flange. The bags are then automatically compressed by mechanical means so that the wrapper may be tightly secured around the bags to hold them rigidly within the package thus formed.

For most efficient packaging I find that it is highly essential to accurately center the bag stack on the wrapping paper. Otherwise the paper cannot be wrapped around the bag stack to completely enclose it or an excessively large sheet of paper must be used which would increase the cost of packaging. For this purpose, I provide a removable bag guide which extends between the fixed plate and movable flange. This bag guide is so positioned that by placing the upright end edge of each bag against the guide the longitudinal axis of the bag stack will be for practical purposes parallel to and directly above the longitudinal axis of the wrapping paper. Thus, the bags may be quickly and accurately centered on the wrapper without the necessity for further handling.

In the preferred form of my invention the device is tilted to position the movable flange below the level of the fixed plate. Stacking is started at the movable flange and the angle of tilt is such that the bags, which are placed on edge in the device, tend to gravitate toward the flange. Thus the weight of each bag holds it in an upright position against the bag ahead of it and the stack may be easily and conveniently formed without danger of the last bag falling which would necessitate its being restacked before subsequent bags are placed in line.

This invention can readily be understood by reference to the accompanying drawing in which Fig. 1 is a top plan view of my invention; Fig. 2 is a sectional view taken on line 2—2 of Fig. 1 showing the movable flange and fixed plate; Fig. 3 is a sectional view taken on line 3—3 of Fig. 2; Fig. 4 is a sectional view on line 4—4 of Fig. 2 and shows the bag guide mounting means.

In the baling machine illustrated the various members are mounted on table 10 and include a fixed, but removable, abutment plate 12 secured slightly above one end of the table by U-shaped brackets 14. Abutment plate 12 may be secured

2

in brackets 14 by means of an easily removable pin 15. Brackets 14 are bolted to supporting members 16 which are provided with a series of bolt holes 18 for adjusting the position of the plate for bag stacks of different length. Largely covering table 10 and extending under the abutment plate is a slidable metal platform 20 with an upright flange 22 at one end. The force necessary to slide this flanged platform on table 10 is supplied by a double acting air cylinder 24 which is connected by suitable levers, later described, to flange 22.

In operation, a sheet of wrapping paper 26 is placed upon the platform with its front edge corresponding to the side edge of table 10. A considerable portion of the paper extends over flange 22 and under abutment plate 12. The bags 27 are then manually stacked upon this paper between the flange and abutment plate. In order to insure accurate positioning of the bags crosswise on the wrapping paper I provide a bag guide 28 consisting of a strip of angle iron which extends between flange 22 and the abutment plate supporting member 16. This bag guide is provided with arms 30 secured by slots 32 and bolts 34 to L-shaped brackets 36 which are pivotally mounted on a shaft 38. Spring 39 attached to table 10 and brackets 36 carries a portion of the weight to assist rotation of the guide around shaft 38. A handle 40 is provided on top of the bag guide by which it may be rotated around the shaft away from table 10 so that flange 22 and abutment plate 12 are free to compress the bags after they have been positioned in the apparatus.

This bag guide is adjustable for bags of different length and for different size packages. For different length bags, bolts 34 are loosened and guide 28 is moved across table 10 and then locked in place where it will center the bag stack on the wrapping paper. In order to adjust the guide to correspond with the position of abutment plate 12 for different size packages, I provide an extension 42 mounted on bag guide 28 by bolts 44 and slot 46. This extension is locked in place by bolts 44 for the desired setting of abutment plate 12 and forms a continuous guide from the abutment plate to flange 22. Thus, the bags may be quickly and accurately stacked on paper 26 simply by placing the upright end edge of each bag against the guide. This positions the longitudinal axis of the stack for practical purposes directly above and parallel to the longitudinal axis of the wrapping paper so that the size of the wrapper may be correlated to the bag size to insure the most economic use of paper.

With the bags accurately positioned on wrapping paper 26 the operator compresses the stack by sliding flange 22 toward abutment plate 12. The force necessary for this operation is provided by double acting air cylinder 24. This cylinder is actuated by a conventional air slide valve 48 which directs air under pressure from supply line 50 to opposite ends of the cylinder through tubes 52 and 54. Piston rod 56 of this cylinder is connected to a pair of forcing levers 58 by cross head 60. These levers are pivoted at their lower ends on a shaft 62 mounted by suitable bearings 64 and at their upper ends they are secured to connecting links 66 by shaft 68. The links in turn connect the forcing levers to the flange 22 of platform 12 by rollers 70 on a shaft 72 which is mounted in slots 74 of the upright angle irons 76 and to guide bars 78 by arms 80 and shaft 82.

To compress the bag stack, valve 48 is set to supply air through tube 52 which drives the piston and piston rod of air cylinder 24 to the right. This forces levers 58 to the right and they are guided in the middle of opening 84 in table 10 by arms 80 of guide bar 78. The force of compression is transmitted from the levers through connecting links 66 to shaft 72 and in turn to rollers 70 which distribute this force evenly over the surface of flange 22. This pushes the flange toward abutment plate 12 and tightly compresses the bag stack between these members.

As the flange moves toward the abutment plate, slidable platform 20 is moved with the flange and slides wrapping paper 26 along the undersurface of the bag stack in the direction of compression. I find that this prevents gathering or wrinkling of the wrapping paper because the paper moves out from under the bags a distance equal to that moved by flange 22 in shortening the length of the stack by compression. Thus there is no tendency for excess paper to form under the stack and the finished package may be tightly wrapped to hold the bags in their compressed state.

The compressed bags are packaged by tightly folding the ends of the wrapping paper over the stack where they are secured to each other by suitable adhesive. This forms an open paper wrapper around the bag stack and abutment plate 12. After the adhesive has taken hold, pressure on the stack is released by setting valve 48 so that air is supplied through tube 54 to air cylinder 24 which forces flange 22 away from the abutment plate. This plate is then conveniently pulled from U-shaped brackets 14 and out of the paper wrapper by handle 86 provided for such purpose. The open ends of the wrapper are now tightly folded around the compressed bag stack and glued to form the finished package.

In the preferred form of my invention shown the top of table 10 is tilted at an angle so that platform 20 extends to the right at an angle with a horizontal plane through the base of flange 22. As shown in Fig. 2, stacking of the bags on wrapping paper 26 is started at flange 22 and the angle of tilt is such that the bags tend to rest against the flange and each other. After the stack is partially formed wrapper 26 is pulled taut to form a right angle corner at the base of flange 22 and the bag weight against the flange anchors the wrapper in position. This eliminates the formation of wrinkles of excess paper against flange 22 when the finished stack is compressed and the package may be tightly formed to hold the bags in their compressed state for shipment.

The materials used in the construction of my baling machine are those conventionally used for this type of structure.

It will be understood that it is intended to cover all changes and modifications of the preferred embodiment of this invention herein chosen for the purpose of illustration which do not constitute departures from the spirit and scope of the invention.

What I claim is:

1. In a baling machine the combination of a movable platform with a flange at one end adapted to receive a sheet of wrapping paper for packaging a stack of paper bags placed thereon, a removable abutment plate held immediately above said platform in position to cooperate with the flange for applying pressure to the bag stack, reciprocating means for moving the platform to slide the wrapper under said abutment plate and compress the bag stack between said flange and abutment plate, said means being adapted to hold the bags compressed until the ends of the paper are wrapped and glued around the bag stack and said means being further adapted to release the pressure so that the abutment plate may be removed from the open wrapper, after which the finished package is formed.

2. A structure as specified in claim 1 in which the abutment plate is adjustable in relation to the platform so that its position may be changed for bag stacks of different length.

3. A structure as specified in claim 1 in which the platform extends at an angle to a horizontal plane through the base of said flange whereby the bags tend to gravitate toward the flange.

4. In a baling machine the combination of a movable platform with a flange at one end adapted to receive a sheet of wrapping paper for packaging the stack of paper bags placed thereon, a removable abutment plate held immediately above said platform in position to cooperate with the flange for applying pressure to the bag stack, a removable guide bar positioned above and along one side of said platform adapted to form a guide for the bags to center them across the wrapping paper, means for rotating said guide away from the platform after the stack has been formed, reciprocating means for moving the platform to slide the paper wrapper under said abutment plate and compress the bag stack between said flange and abutment plate, said means being adapted to hold the bags compressed until the ends of the paper are wrapped and glued around the bag stack and being further adapted to release the pressure so that the abutment plate may be removed from the open wrapper, after which the finished package is formed.

5. A structure as specified in claim 4 in which the bag guide is adapted to be adjusted for different length bags.

6. A combination of a table with an inclined top surface, a platform with an upright flange at one end slidably mounted on said table top and adapted to receive a sheet of wrapping paper for packaging a stack of paper bags placed thereon, a removable substantially vertical abutment plate held immediately above said platform in position to cooperate with said flange for applying pressure to the bag stack, said table top being tilted at such an angle that the bags tend to gravitate toward the flange, a removable guide bar positioned above and along one side of said platform adapted to form a guide for the bags and center them across the wrapping paper, means for rotating said guide away from the

platform after the stack has been formed and reciprocating means including an air cylinder for sliding the platform to compress the bag stack between said flange and abutment plate and to slide the wrapping paper under the abutment plate with said means being adapted to hold the bags compressed until the ends of the paper are wrapped and glued around the bag stack and being further adapted to release the pressure so that the abutment plate may be removed from the open ended wrapper, after which the finished package is formed.

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