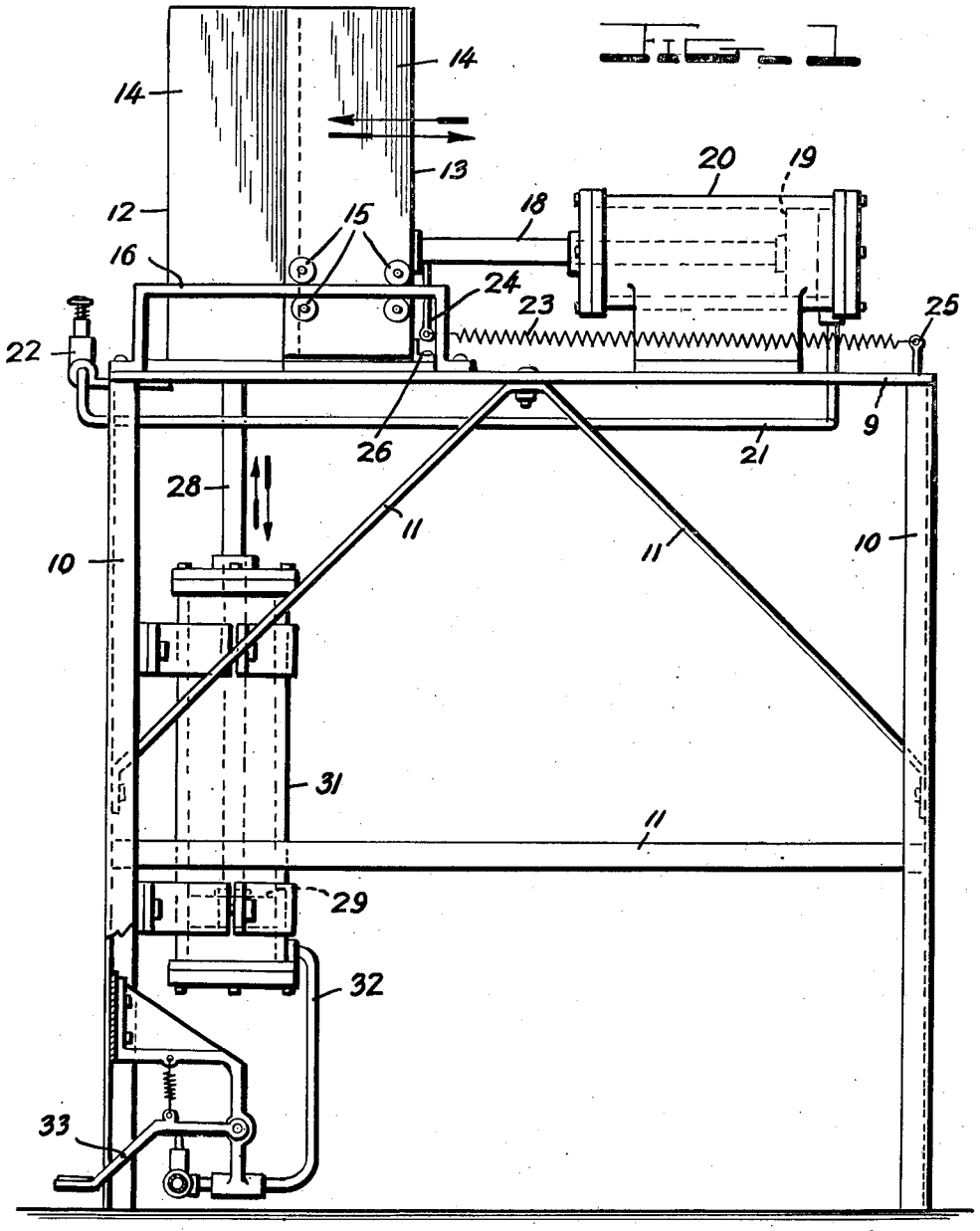
March 14, 1950 J. W. HALL ET AL 2,500,819

PACKAGING MACHINE

Filed Nov. 13, 1945 3 Sheets-Sheet 1



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PACKAGING MACHINE

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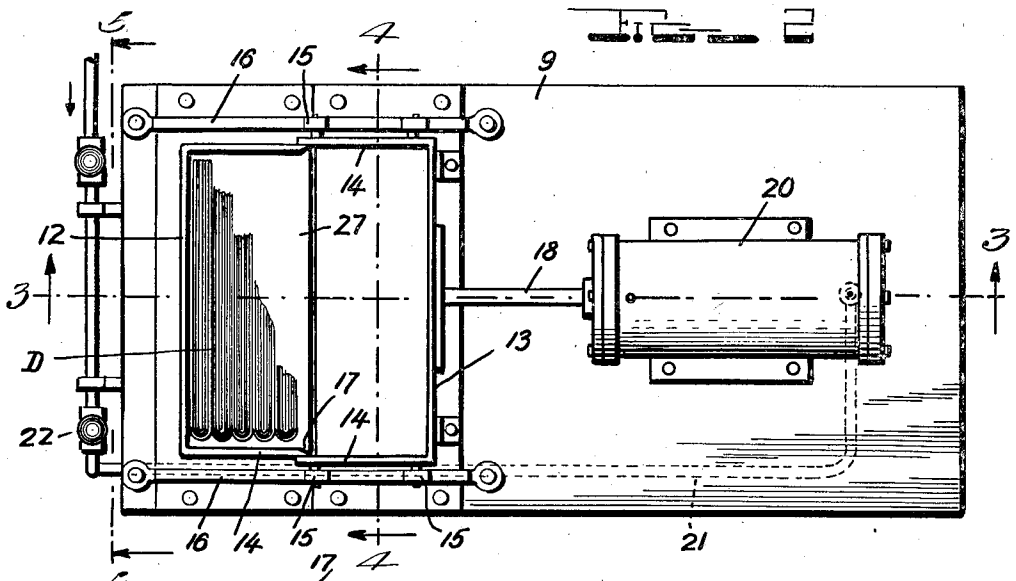


Fig. 2

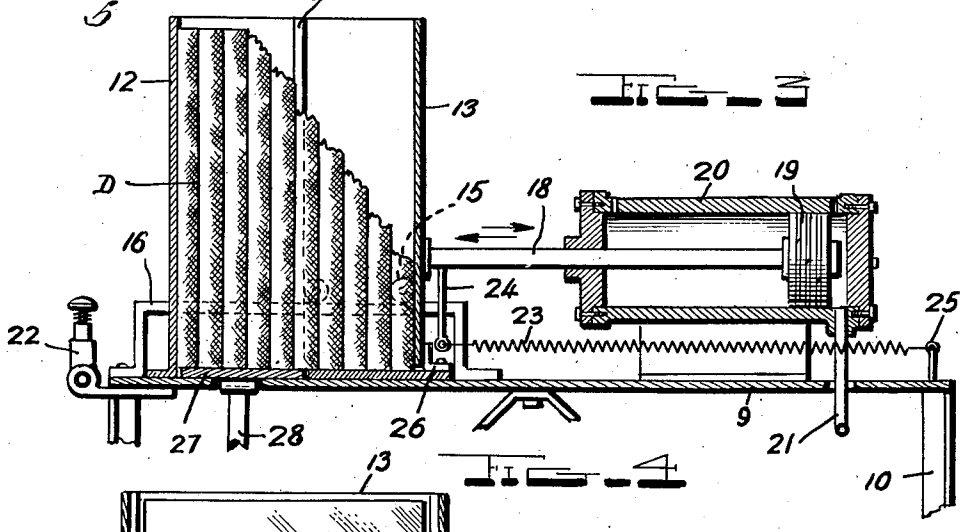


Fig. 3

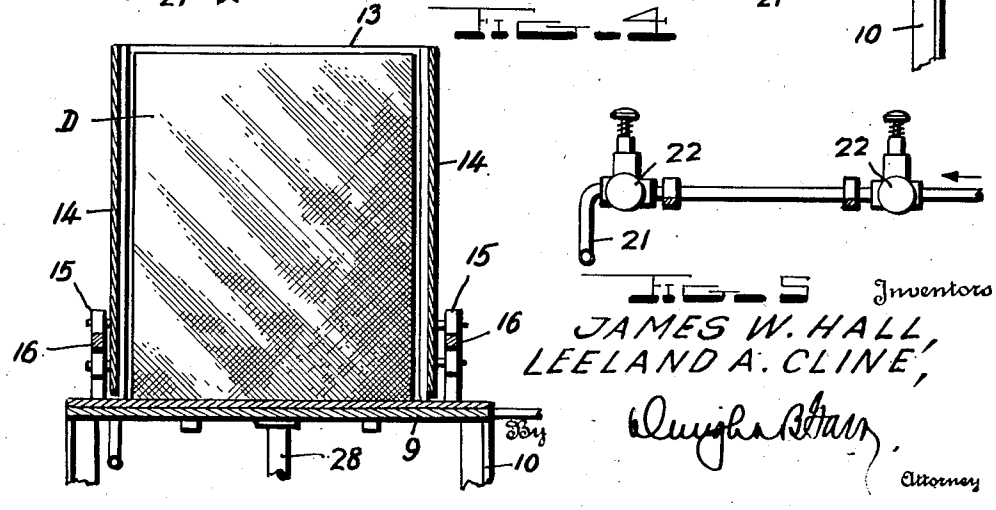


Fig. 5

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PACKAGING MACHINE

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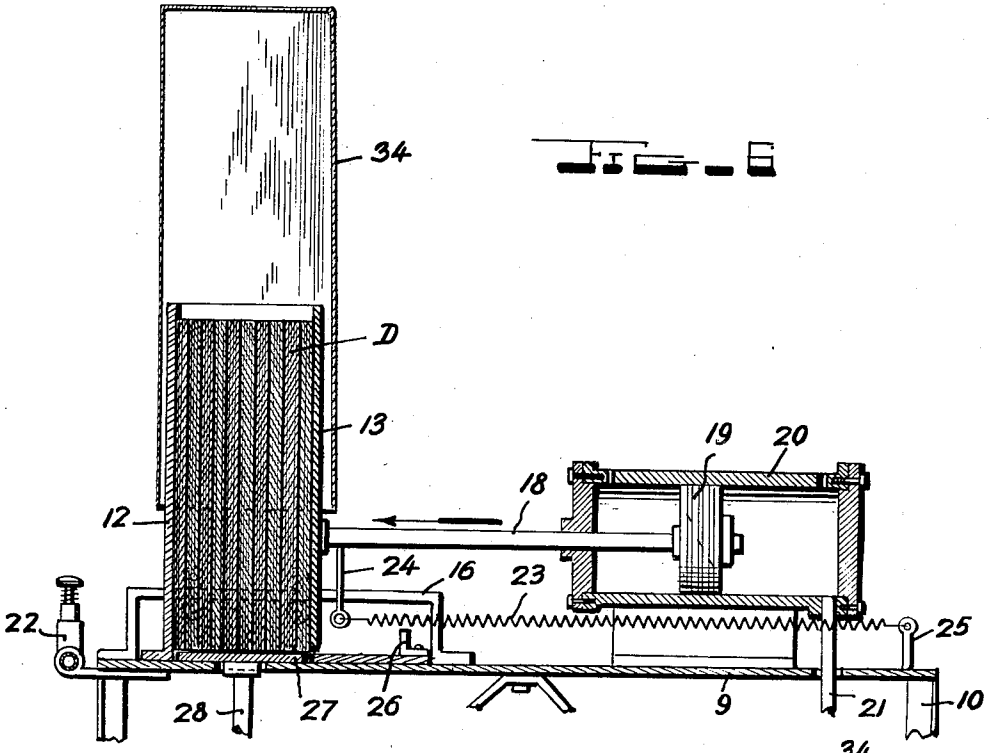


FIG. 6

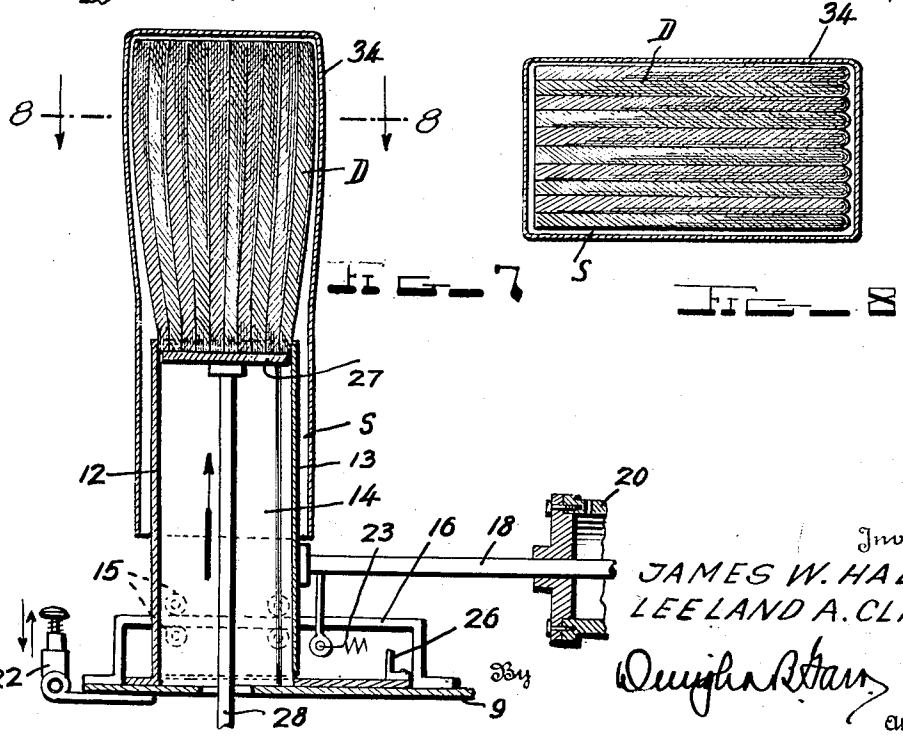


FIG. 7

FIG. 8

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UNITED STATES PATENT OFFICE

2,500,819

PACKAGING MACHINE

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Application November 13, 1945, Serial No. 627,978

3 Claims. (Cl. 226—18)

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This invention is a packaging machine and is directed particularly to the compressing and packaging of folded articles, such as diapers.

The preparation of laundered diapers for delivery to the customer has heretofore involved wrapping by hand of stacks of the desired numbers of diapers properly folded and tying or securing the package with tapes. This procedure has required the use of a number of employees where business of any considerable size is carried out, and a particular objection is a lack of uniformity in size of the completed package, as well as the fact that a hand-wrapped package cannot be compressed to as small a dimension as is possible with the use of power mechanism beyond the strength of human hands. Moreover, the process of hand wrapping packages of this kind is more or less tedious and comparatively slow.

It is the primary object of the present invention to provide means whereby goods or articles of the kind mentioned may be compressed into comparatively small size and in this condition inserted into a container of predetermined size, by mechanical means and with the assurance that the goods thus packaged will be of small compass and will constitute a tightly filled, easily stacked and as easily handled package.

A further object of the invention is to provide mechanical means of the character generally stated capable of being actuated by a single operator with the exercise of little or no mechanical skill, and with a minimum of effort on the part of such operator.

A further object of the invention is to provide packaging means of the character stated of such construction as to permit of adjustment of the various parts in order that it may be adapted to the packaging of articles varying in size or number.

A still further object of the invention is to provide mechanism of the character stated which is of simple construction, which involves the use of comparatively few easily assembled and readily replaceable parts, which has its parts so constructed and arranged as to minimize the opportunity for wear, breakage or derangement, which is extremely simple in its operation, and which will prove thoroughly practical and efficient in use.

With the foregoing objects in view, together with others which will appear as the description proceeds, the invention consists in the novel construction, combination and arrangement of parts, all as will be described more fully hereinafter, illustrated in the drawings, and particularly pointed out in the claims.

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In the drawings:

Fig. 1 is a side elevation of a packaging machine constructed in accordance with the invention,

Fig. 2 is a top plan view of the machine,

Fig. 3 is a longitudinal sectional view taken substantially upon the line 3—3 of Fig. 2,

Fig. 4 is a transverse sectional view taken substantially upon the line 4—4 of Fig. 2,

Fig. 5 is a similar view taken upon line 5—5 of Fig. 2,

Fig. 6 is a central longitudinal sectional view showing the parts in the position they will assume when the compressing operation has taken place and a sack or other container is in position to receive the compressed articles,

Fig. 7 is a fragmentary sectional view illustrating the compressed articles being ejected from the compressor and into the sack, and

Fig. 8 is a transverse sectional view taken substantially upon line 8—8 of Fig. 7.

In carrying out the invention, a table 9 is supported at a proper height by legs 10 properly braced and reenforced by elements 11 to produce a rigid support for the parts to be hereafter described and to resist the strains and pressures to which it will be subjected.

The forming and compressing device includes relatively movable members 12—13. These members are substantially identical in form and are adapted to receive within them stacked or loosely piled articles to be formed and compressed, after which the relative movement takes place to bring about this forming and compressing. The member 12 comprises a channel formed preferably of metal rigidly secured in upstanding position upon and near one end of the table 9. This channel member is open at top and bottom as well as at one side. The member 13 is a similar channel, open at top and bottom as well as at its side facing the open channel member 12, and the sides 14 of the members 12 and 13 are arranged in overlapping or telescoping relationship. The member 13 has spaced rollers 15 at its opposite sides which engage with the horizontally disposed track 16 secured to the table 9 beyond each side of the former. The forward edges of the sides 14 of member 12 are beveled as indicated at 17 in order that the articles to be compressed may easily slide into the member 12 when the compressing action takes place, as well as to obviate the possibility of any of the articles or parts of them becoming pinched or

engaged between the slidable walls of the compressor element.

The means for moving the member 13 relative to the affixed member 12 includes a rod 18 permanently secured at its outer end to the rear wall of the member 13 and to its other end to a piston 19 slidable within a cylinder 20 rigidly secured upon the table 9. An air pressure pipe 21 communicates with the interior of cylinder 20 behind the piston 19, and the flow of air through this pipe is controlled by valves 22 of any suitable form and so positioned as to be within convenient reach of the operator of the machine. It will be understood, therefore, that operation of the valves 22 to admit pressure behind piston 19 will force the latter outwardly, carrying with it the slidable member 13 of the compressor. A spring 23 connected at one end as at 24 to the rod 18 and at its opposite end to a fixed element 25 on the table will retract the rod, piston and member 13 when the pressure in the air pipe 21 is released. The degree of retraction of the member 13 is determined by a stop 26 affixed to the table top, and it will be understood that adjustments of these stops may be made to govern the degree of opening of the compressor member. This may be determined by the size of the package to be formed.

The lower end of the channel member 12 is closed by a bed plate 27, the latter conforming substantially to the interior dimensions of the member 12. This bed plate is secured to the upper end of a rod 28, the lower end of which is secured to a piston 29 slidably arranged within a vertically disposed cylinder 31, whose lower end is supplied with air by means of a pipe 32 controlled by a valve operated by a pedal or foot lever 33. This lever is located within convenient reach of an operator standing before the machine to govern the movements of the valves 22 and to handle the articles to be operated upon by the machine.

In operation, the laundered diapers, or similar articles, folded to the proper size and stacked in the desired number, are inserted in upstanding position within the former with the members 12—13 thereof in separated or "open" position. In such position, the member 13 is retracted to its limit while the bed plate 27 is at the limit of its lowermost movement within the channel member 12. With the articles thus applied to the former, the valves 22 are operated to admit air to the cylinder 20, whereupon the rod 18 is moved forwardly, forcing the member 13 into telescopic relationship with the fixed member 12 and compressing the stacked articles D between the members. The member 13 when moved to its extreme forward position, as shown in Figure 6, will so compress the articles D that they will overlie the bed plate 27. When this compressing action has taken place, a bag or sack 34, of predetermined size and depth, will be placed in inverted position over the upper open end of the former as shown in Figures 6–7. This sack will be slightly larger in cross section than the transverse dimension of the compressed articles. With the sack in the position shown, the operator uses the hands to hold the opposite sides of the sack firmly against the ends of the telescoped members 12—13, at which time the pedal 33 is depressed to admit air behind piston 29, forcing rod 28 and bed plate upwardly and ejecting the articles D supported thereon from the upper open end of the former. Due to the fact that the sack 34 is of slightly greater transverse dimension than the compressed articles, such air as might be trapped within the sack will escape through the space indicated at S in Figures 7–8 between the walls of the sack and the adjacent walls of members 12—13. With the stacked articles thus inserted in the bag, the said articles will expand slightly so as to comfortably fill the sack, and after the latter has been removed from the top of the former the open end of the sack may be folded over and secured to thus complete the package.

From the foregoing it will be seen that the former first applies a high degree of pressure to the loosely stacked articles, and this uniform degree of pressure prevails in each successive operation of the machine. The lateral dimension of the sack 34 will be determined, of course, by the number of articles to be encompassed by the sack, as well as by the desired tightness of the finished package. As will be seen, the operations of the mechanism are controlled by the hand and foot of a single operator so that all that is required is an additional operator to fold and seal the open ends of the filled sacks. The process, therefore, of compressing, inserting and wrapping folded or stacked goods of the character stated may be expeditiously carried out with a minimum of manual effort, while at the same time finished packages of uniform size or bulk are assured. The construction and arrangement of the mechanism is such that upon release of the rods 18 and 28, the member 13 will be immediately retracted by spring 23 and the bed plate will be lowered by gravity to its original position. These operations, quickly carried out, permit of rapid functioning of the machine.

We claim:

1. In a packaging machine, a former comprising a pair of relatively movable members open at one end and adapted to receive materials to be packaged, a movable bottom within said former to support said materials, means for operating the former to compress the materials therein to a predetermined degree, a sack closed at one end and of greater transverse dimension than the compressed materials having its open end engaged over the open end of said former, and means for moving said bottom and the materials thereon into said sack.

2. In a packaging machine, a former open at one end and comprising relatively movable members adapted to receive between them materials to be packaged, means for moving said members into material compressing position, a movable bottom within said former supporting said materials, means for operating said members to move relatively to one another, a sack closed at one end and having its open end inserted over said former when the latter is in compressing position, said sack being of greater transverse dimension than the distance between said movable members when in compressing position, and means for moving said bottom toward said open end.

3. In a packaging machine, a former comprising a pair of relatively movable members open at one end and adapted between them to receive materials to be compressed and packaged, a sack closed at one end and having its open unobstructed end engaged over the open end of said former when the members thereof are in compressing position, the lateral dimension of said sack being greater than the lateral dimension of said former when in compressed position to provide an air

space between said members and the sides of said sack, and means for moving the compressed materials from between said members into said sack.

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