July 12, 1932. H. S. LABOMBARDE 1,867,538

PACKAGING MACHINE

Filed Aug. 7, 1930 4 Sheets-Sheet 1

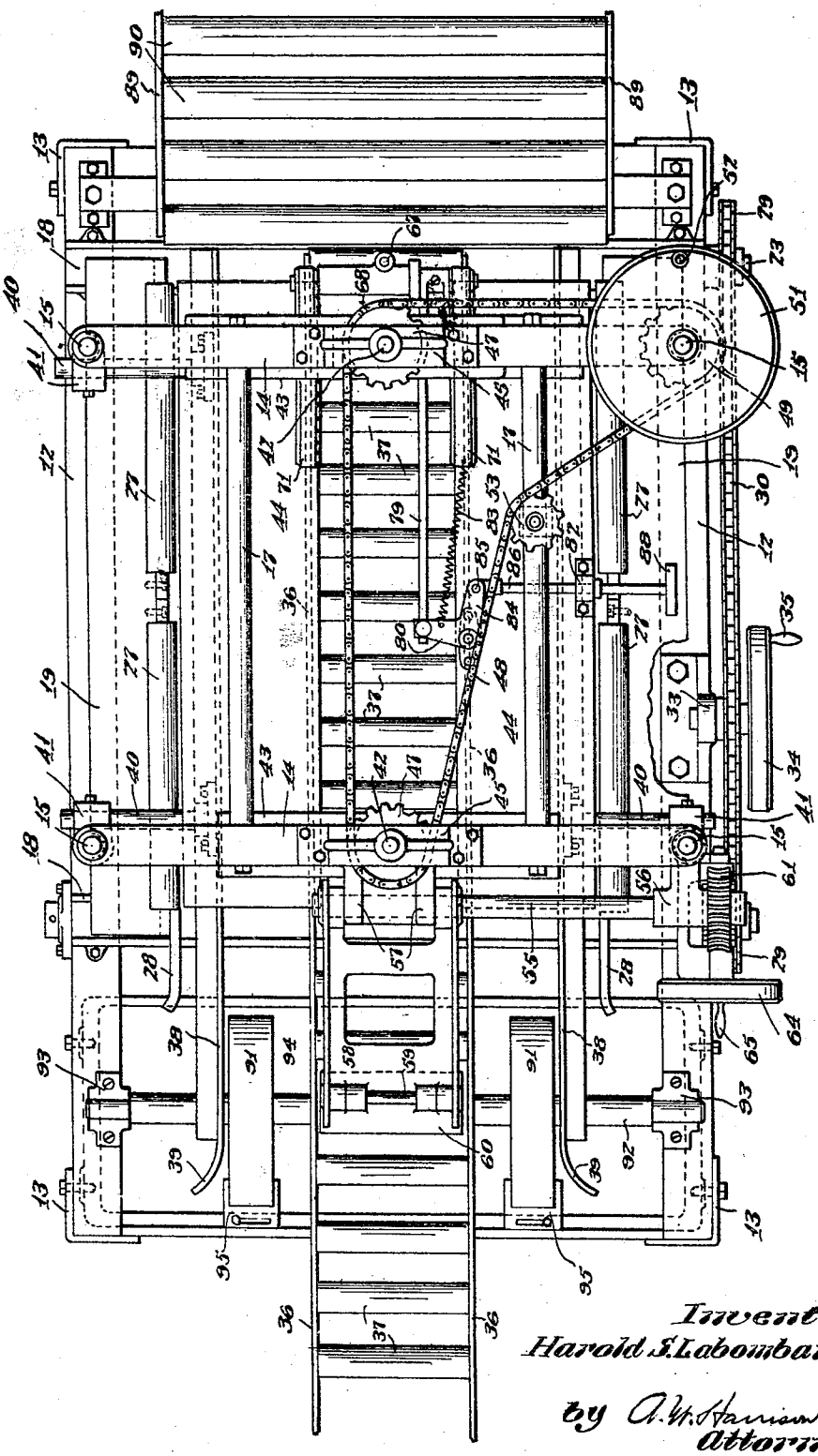


Fig. 1.

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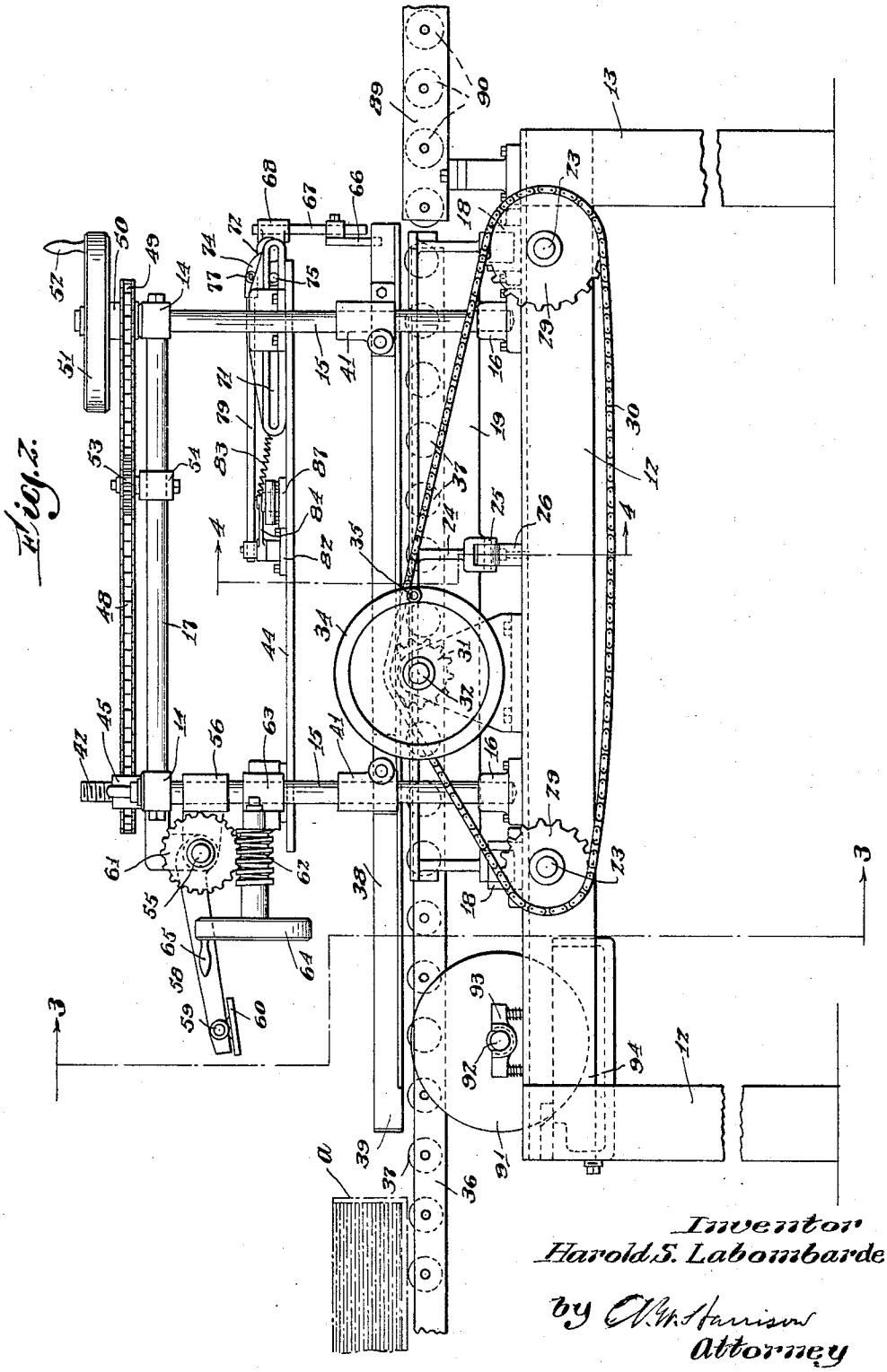


Fig. 2.

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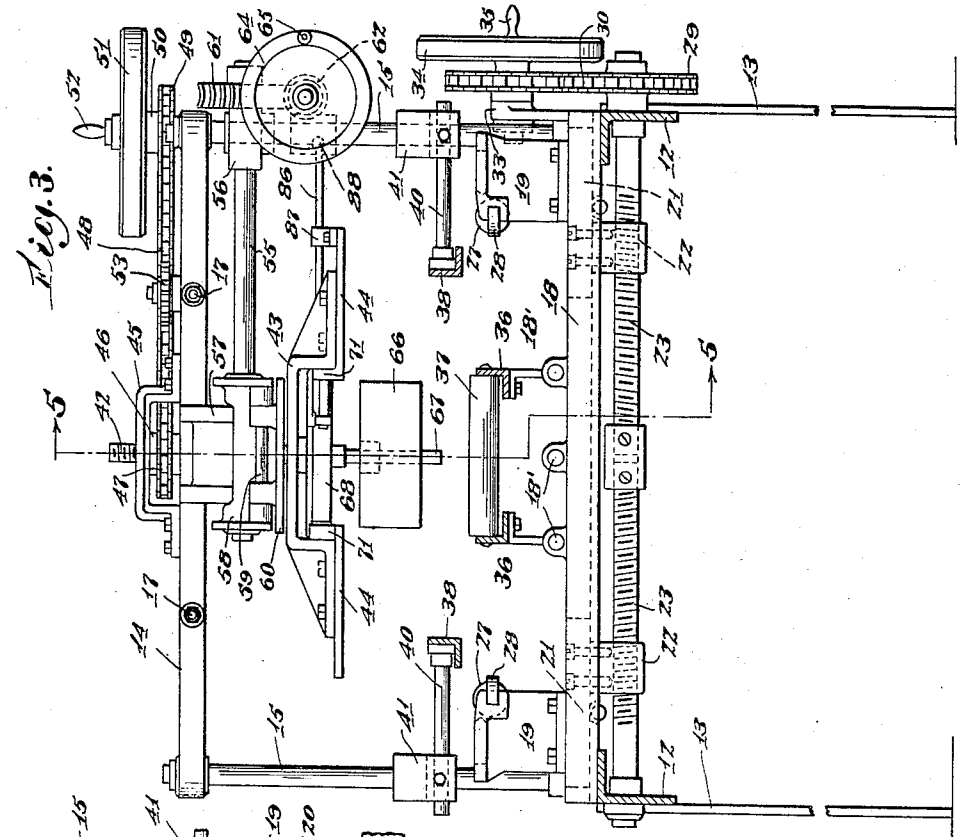


Fig. 3.

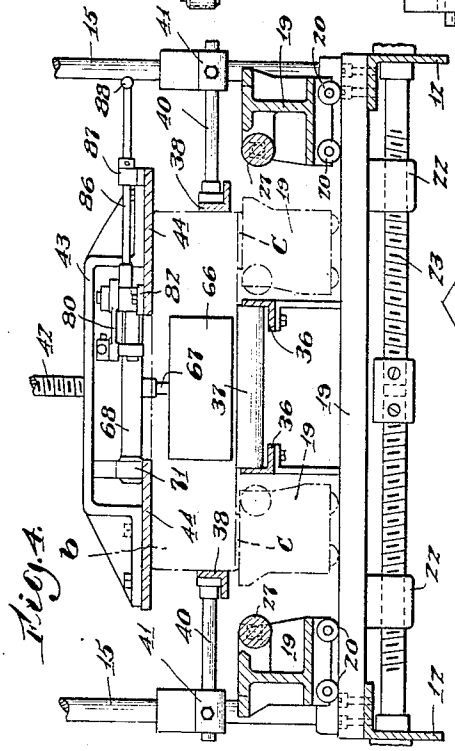


Fig. 4.

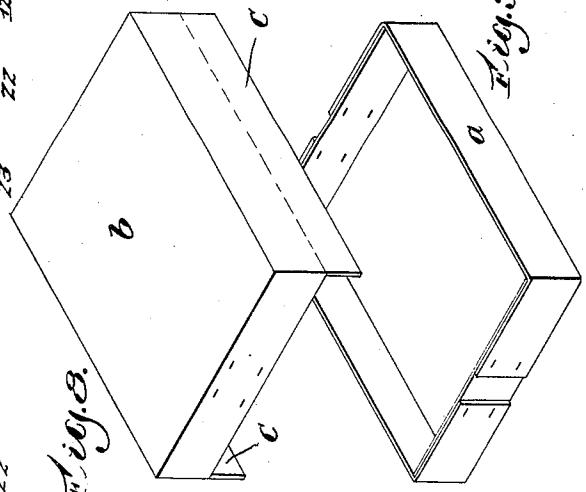


Fig. 5.

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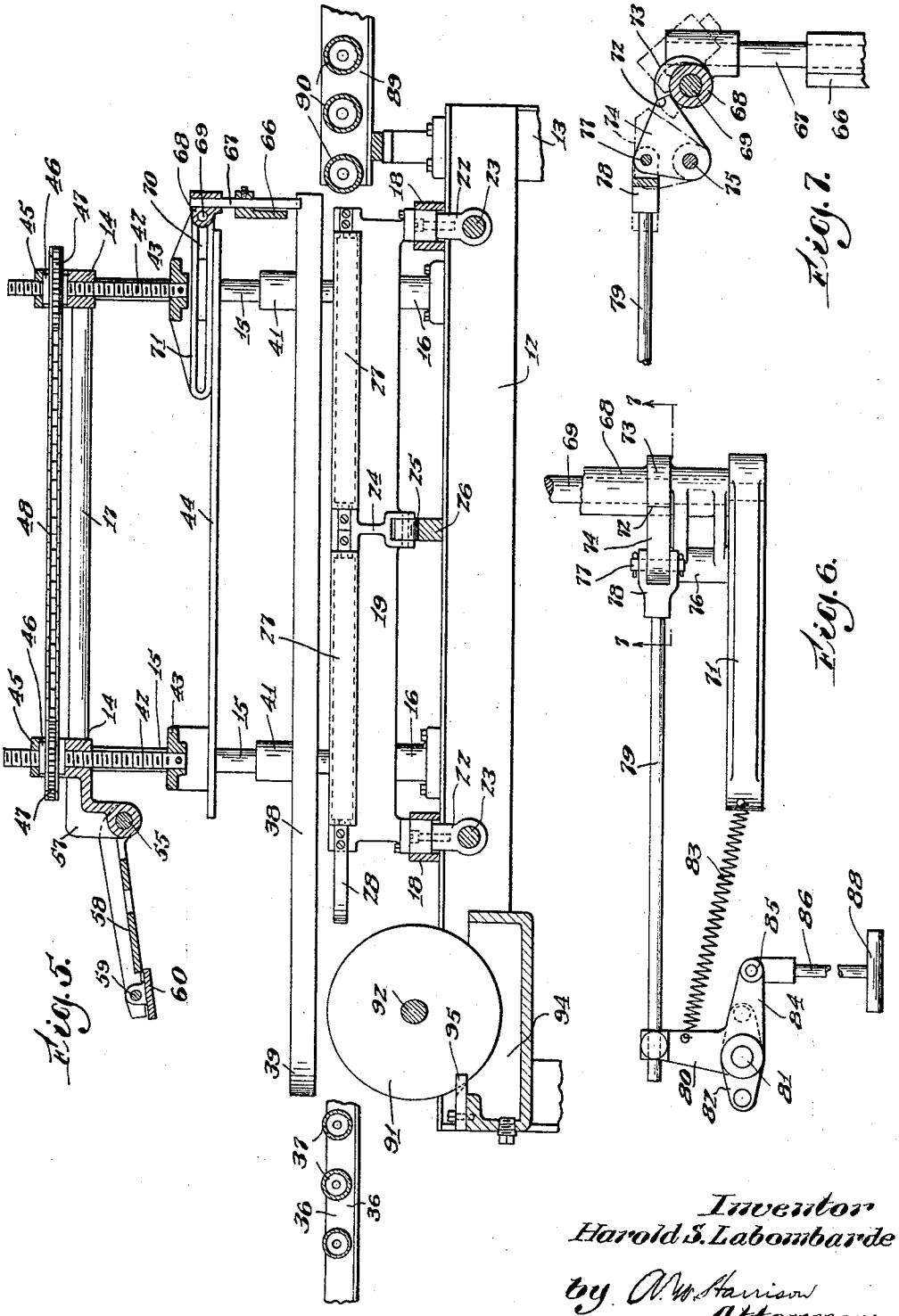


Fig. 5.

Fig. 7.

Fig. 6.

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Patented July 12, 1932 1,867,538

UNITED STATES PATENT OFFICE

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PACKAGING MACHINE

Application filed August 7, 1930. Serial No. 473,657.

This invention relates to the economic production of heavy sealed packages capable of storage, transportation and delivery without liability of injury to the goods or breakage of the seals, and has particular reference to such packaging of sheets of paper material, although not being limited to any particular kind or quality of the goods.

To suitably pack for shipment, a large quantity of such goods as sheets of paper, great care has been required and a large amount of time consumed to ensure delivery of the goods in proper condition. For example, a ream of paper such as card board sheets 22″ x 28″ may weigh from 150 to 175 pounds. To prevent the sheets from slipping relatively to each other, or having corner portions bent, expert packing is required. To hold such a package tightly, various means are employed such as rope or metal straps. And even then, if the package is to be sealed, reliable sealing is difficult to accomplish.

One of the objects of the present invention is to provide means for securely sealing packages of heavy goods such as flat sheets of paper or cardboard, in a carton, without requiring additional securing means such as rope, twine, metal straps, or even sealing tape.

Another object is to provide means for the packaging of such goods in cartons which may be loaded to various depths and sealed at such depths of loading, without requiring any addition to the carton members to hold them sealed.

With the above-mentioned objects in view, and others hereinafter referred to, the invention consists in the mechanism and the parts thereof substantially as hereinafter described and claimed.

Of the accompanying drawings:—

Figure 1 is a plan view of the machine, a small portion thereof being broken out.

Figure 2 is a side elevation of the machine.

Figure 3 represents a section on line 3—3 of Figure 2.

Figure 4 represents a section on line 4—4 of Figure 2.

Figure 5 represents a section on line 5—5 of Figure 3, on a larger scale, and omitting some of the package-supporting rolls, to avoid confusion of lines.

Figure 6 is a detail view of the releasable package-arresting mechanism.

Figure 7 represents a section on line 7—7 of Figure 6.

Figures 8 and 9 are perspective views of the two members of a carton to be loaded and sealed.

Similar reference characters indicate similar parts of features in all of the views.

The machine as a whole is designed to facilitate the preparation of goods for shipment, by providing means whereby, after the receptacle member of a carton is supplied with goods and a cover member is applied thereover, the cover member is slidably compressed onto the receptacle member to closely confine the contents, and portions of the receptacle and cover members are sealed together while under pressure, the advantages of which are pointed out in the application Serial Number 467,443, filed July 12, 1930, by Carl E. Lincoln.

The frame of the main portion of the machine comprises lower side members 12 supported by suitable legs 13, and upper members 14 supported by uprights 15 rigidly mounted at 16 (Figs. 2 and 5) on the frame bars 12. The two upper members 14 are rigidly connected by rods 17.

Two cross bars 18 rigidly connect the lower frame members 12, and said bars 18 support two carriages 19 with intermediate rolls 20 (Fig. 4). The said bars 18 are slotted and the carriages have base portions 21 (see dotted lines in Figure 3) to which are connected internally threaded sleeves 22 engaged by right and left hand screws 23 whereby, as will be explained, the two carriages may be shifted toward and from each other as indicated by the full and dotted line positions illustrated in Figure 4. To ensure direct inward movement of the carriages 19 when exerting inward pressure on a carton between them as will be described, to oppose tendency of the carriages to tilt backwardly, the inward end portions of the bases 21 pass under rolls 18′ supported by the cross bars 18.

At the mid-length of each carriage 19 (Fig.

5) is a bracket 24 having a roll 25 riding on a fixed cross rail 26.

Idly mounted in bearings in the bracket 24 and in bearings at the ends of the carriages 19 are long rolls 27, and extending from one end of each carriage is a finger 28 having an outwardly extending or flaring tip.

To effect simultaneous movement of the two carriages with their rolls 27 toward and from each other, the ends of the right and left hand screws 23 are provided, at one side of the machine, with sprockets 29 (Figs. 1, 2 and 3) which are engaged by an endless chain 30, the latter also engaging a sprocket 31 carried by a stud shaft 32 mounted in a bearing 33 and having a wheel 34 provided with a handle 35.

Between the two carriages 19 and rigidly supported by the frame of the machine, as by struts such as illustrated in Figures 3 and 4 are two long angle bars 36 providing bearings for a series of rolls 37. Said bars 36 and their rolls 37 extend for an indefinite distance from the left of Figures 1, 2 and 5, to provide a platform on which the receptacle member of a carton may rest while being loaded or filled with the articles, such as sheets of paper or cardboard, that are to be packaged. To facilitate an understanding of the utility of the machine, Figure 2 illustrates, by dotted lines, a portion of the receptacle member of a carton supported on the rolls 37 of the supply platform.

To properly direct the package, when shifted from the loading or supply end of the platform 36, 37, to position between the carriages 19, guide strips 38 are provided, said strips having diverging ends 39 (Fig. 1) and being supported by rods 40 adjustably mounted in sleeve brackets 41 which, in turn, are adjustably mounted on the uprights 15 (Figs. 4 and 5). The adjustable mountings just described are to provide for operation on different sizes of cartons.

Each upper frame bar 14, at about its mid-length, has an aperture for a vertical screw 42 (Figs. 1 and 5) secured to and rising from a cross bracket 43. The two brackets 43 are connected by two plates 44 (Figs. 3, 4 and 5) which act as pressers as hereinafter described. Secured to the top of each bar 14 is a small bracket 45 having an aperture through which the upper end of the screw 42 extends. In the space between each bracket 45 and the bar 14 is a bushing 46 internally threaded to fit the screw 42 and having a sprocket 47. A chain 48 engages the two sprockets 47 and is also engaged by a sprocket 49 (Figs. 1, 2 and 3) carried by a bushing 50 mounted rotatably on the upper end of one of the uprights 15 and having a wheel 51 provided with a handle 52. This chain also engages a sprocket 53 (Figs. 1 and 2) carried by a sleeve 54 adjustably mounted on one of the rods 17 to serve as a tightener for the chain. By means of the wheel 51 and its handle, the chain 48 may be actuated to rotate the sprockets and their internally threaded bushings on the screws 42 to effect lowering or raising of the pressure plates 44.

After a complete carton, with its load, is pushed along the platform to position under the pressure plates 44, mechanism is employed to exert endwise pressure against it, a stop plate presently described being temporarily in position to arrest the package in that position. The mechanism for pushing the package against said stop plate will now be described.

A shaft 55 (Figs. 1, 2 and 3) is mounted at one end in a bearing provided in a bracket 56 mounted on one of the uprights 15, and at the other end in a bearing provided in a bracket portion 57 of one of the upper frame bars 14. Secured to said shaft 55, at opposite sides of the bracket 57, is a frame 58 having a cross pin 59 on which is mounted the pushing plate 60 (Fig. 5). The outer end of the shaft 55 has a pinion 61 engaged by a worm 62 mounted in a bearing in a bracket 63 secured to the upright 15 below the described bracket 56, said worm having a wheel 64 provided with a handle 65 by means of which the swinging frame 58 and its pusher plate 60 can be swung down from the raised position illustrated in Figures 2, 3 and 5 and caused to press a complete carton in front of it against the stop which will now be described.

The plate 66 which serves as the stop is temporarily locked in vertical position, but can be released so as to swing out of the way to permit a sealed package to be moved onto the delivery platform presently described. Said plate 66 is mounted on a rod 67 depending from a sleeve 68 mounted on a cross pin or shaft 69 the ends of which are mounted in bearings carried by blocks 70 which latter are adjustable along ways 71 supported by the two pressure plates 44, said adjustable mounting being provided to enable the stop plate to be located variably in a direction longitudinally of the machine according to the sizes of the packages to be operated upon.

The sleeve 68 (Figs. 2, 6 and 7) has a projecting shoulder 72 the rear surface 73 of which is somewhat cam-shaped. A latch 74 cooperates, when in the full line position Figure 7, in holding the stop plate 66 locked in its vertical operative position, but is releasable by the mechanism now to be described.

The lower part of the latch 74 is pivoted at 75 to lugs 76 projecting from the sleeve 68 (Fig. 6) and its upper part is pivoted at 77 to a fork 78 at one end of a rod 79 the other end of which is connected to one arm 80 of an elbow lever which is pivoted at 81 to a block 82 mounted on one of the pressure plates 44. A spring 83, connected to the arm

80 and to a suitable fixed point, tends to hold the rod 79 and the latch 74 in the full line position of Figure 7. The other arm 84 of the elbow lever is pivoted at 85 to the inner end of a rod 86 slidably mounted in a bearing 87 (Figs. 1 and 4) and having a handle 88 at its outer end. By pushing the rod 86 inwardly, the elbow lever exerts a pull on the rod 79 in opposition to the spring 83 and rocks the latch to the dotted line position in Figure 7, thereby un-locking the members hung on the shaft 69 and permitting them to be swung out of the way. Upon release of the rod 86, the spring 83 tends to return the latch 74 to its normal position. If the swinging members have not then returned to position with the stop 66 in normal vertical position, the tip of the latch 74 will simply move onto the cam surface 73 for a moment, but the complete swinging down of the said members will permit the latch to engage the shoulder 72 and so automatically effect the relocking of the plate 66 in vertical position.

Beyond the stop plate 66 is the delivery platform illustrated as comprising suitably supported bars 89 providing bearings for a series of rolls 90. Said bars and rolls extend for an indefinite distance at the delivery end of the machine. As shown in Figure 1, the rolls 90 are much longer than the rolls 37 at the loading or entrance end of the machine and those along the pressing part of the machine. The reason for this will be explained.

To apply two stripes of adhesive material to those areas of the bottom of the receptacle member *a* (Fig. 9) against which the flaps *c* of the cover member *b* (Fig. 8) are to be folded and pressed, two rolls 91 are provided. Said rolls are carried by a shaft 92 mounted in bearings 93 supported by the frame of the machine, the lower portions of the rolls dipping in glue or other suitable adhesive in a tank 94. Suitable scraper or "doctor" blades are illustrated at 95. The said shaft and rolls may be idly mounted or may be rotated by power if desired. The shaft bearings are yieldingly supported as illustrated in Figure 2.

As has been stated, the principal object of the present invention is to provide a machine whereby sealed packages of heavy goods can be prepared for shipment without requiring any surrounding additional securing means. The operation of the machine to attain this object will now be described:—

A lower or receptacle member *a* (Fig. 9), a portion of which is illustrated by dotted lines in Figure 2, is loaded with goods such as paper sheets while resting on the rolls 37 at the supply or entrance end of the machine, and then the cover member *b* (Fig. 8), the side walls of which have depending flaps *c*, is placed over the member *a*. Then the complete carton is pushed along over the platform rolls 37 until it reaches the stop plate 66, leaving room for the loading of another carton on the outwardly extending portion of said platform. When the inwardly pushed carton reaches, or is about to reach, the stop plate 66, the frame 58 is swung down by means of the wheel 64 and the worm gearing, to cause the pusher 60 to press forcibly against the rear end of the package and carry it against the stop 66 under some compression. On its way to the position just described, the depending flaps *c c* pass freely along the spaces at opposite sides of the platform 36, 37, to be later folded under the bottom of the receptacle member *a*, which bottom has received, during the travel of the carton just described, two stripes of adhesive applied by the rolls 91 along those bottom areas against which the flaps *c c* are to be folded and pressed.

After the package arrives in the position described and while it is being held firmly between the plates 60, 66, it is subjected to two operations, either substantially simultaneously or one after the other. One is to force the plates 44 down on the cover member and slidably move it down closely on the contents of the receptacle member and press it firmly onto the receptacle member to leave no space between the cover member and the top of the layers of material confined in the carton. This is effected by operating the wheel 51 and actuating the chain 48 to cause the latter to rotate the internally threaded bushings 46 on the screws 42. While it is preferable, for some goods, that the receptacle member shall be completely filled to its top before applying the cover member, I do not limit myself to such practice.

The other one of the two operations mentioned, is to force the two carriages 19 in toward each other so that the rolls 27 thereof move from the full-line positions (Fig. 4) to the dotted line positions, and effect folding of the flaps *c c* under those portions of the receptacle member to which the stripes of adhesive were applied by the rolls 91. This operation of the carriages is effected by actuating the wheel 34 and the chain 30.

The sealing of the package just referred to is maintained while the package is subjected to compression by the plates 44 and can last while another carton receptacle is being filled on the projecting portion of the platform 36, 37, and a cover member applied thereto. Such maintenance of the loaded and sealed carton under pressure ensures such firm adhesion of the flaps *c c* (see the dotted indication of the carton in Figure 4) that no additional securing members are required.

After such length of time as is desirable, the loaded and sealed carton is pushed toward and onto the platform 89, 90. To permit this to be done, the rod 86 is pushed in so as to effect movement of the latch 74 to the dotted line position illustrated in Figure 7,

thereby unlocking the stop plate 66 so that it can be freely swung up by the outwardly moving carton. The said carton, and several similar ones, can be left on the delivery platform 89, 90, for a considerable time if such be advisable to permit the adhesive to become more firmly set, the weight of the contents of the cartons ensuring continued pressure on the bottom. For this reason it is preferable to have said delivery platform considerably longer than illustrated in the drawings. As illustrated in Figure 1, the platform provided by the members 89, 90, is considerably wider than that portion of the platform on which the cartons are supported during loading and compression. The narrower portion permits the cover members of the cartons to be fitted closely on the filled receptacle members, with the flaps *c c* extending straight down, and permits the assembled members to be moved along betwen the guide members 38 to position under the compression plates 44, with the flaps still extending straight down where they can be acted upon by the inwardly movable flap folding rolls of the carriages 19. As illustrated by Figures 3 and 4 there are ample spaces between opposite sides of the platform 36, 37, and the guides 38, to permit the flaps of the cover members to be folded in without contact of said flaps with the sides of the platform. But the delivery portion of the platform is wider to effect maintenance of pressure on the sealing flaps of those cartons moved thereonto, as has been described.

During the operation of the machine, it is preferable to leave the carriages 19 and their rolls 27 in their inward positions, and the presser plates 44 down, to secure firm adherence of the inwardly folded flaps before the carton is moved onto the delivery platform. This is to enable the inwardly positioned rolls 27 to support the flaps *c c* against the pressure of the plates 44.

Having now described my invention, I claim:—

1. A machine for securing a cover member having wall flaps to a receptacle member, said machine having means for slidably compressing the cover member onto the receptacle member, and said machine having means for effecting the overlapping of portions of a container, and means for simultaneously effecting sealing of the package and subjecting it to pressure.

2. A packaging machine for operating on a filled receptacle having a cover, said machine having means for slidably compressing the cover onto the receptacle, and means for folding portions of the cover under the bottom of the receptacle.

3. A packaging machine for operating on a filled receptacle having a cover, said machine having means for slidably compressing the cover onto the receptacle, and means for folding portions of the cover under the bottom of the receptacle, and means for exerting pressure against the said folded portions.

4. A machine for securing a cover member having wall flaps to a receptacle member, said machine having means for slidably compressing the cover member onto the receptacle member, and having folders for operating on portions of the cover member of the package, said folders being movable toward each other in a plane to fold portions of the cover member under the bottom of the package.

5. A machine for securing a cover member having wall flaps to a receptacle member, said machine having means for slidably compressing the cover member onto the receptacle member and having folders for operating on portions of the cover member, said folders being movable toward each other in a plane to fold portions of the cover member under the bottom of the package, and means for applying adhesive in locations to effect retention of the said portions of the cover member in their folded positions.

6. A machine such as specified in claim 5 and having means for exerting continued pressure on the package.

7. A machine for securing a cover member having wall flaps to a receptacle member, said machine having means for slidably compressing the cover member onto the receptacle member, and having a platform for supporting packages during compression, said platform having a widened extension at one end.

8. A machine for securing a cover member having wall flaps to a receptacle member, said machine having means for slidably compressing the cover member onto the receptacle member, and having a platform for supporting packages during compression, said platform having a widened extension at one end, the said platform and its extension having rolls for the contact of the packages therewith.

9. A machine for securing a cover member having depending flaps to a receptacle member, said machine having means for slidably compressing the cover member onto the receptacle member, and having a platform one end of which is narrower than the other, rolls at opposite sides of the narrower portion of the platform to apply adhesive to portions of the bottom of the receptacle member, and means at another point of the platform for turning the flaps of the cover member under the receptacle member and applying pressure thereon.

10. A machine for securing a cover member having depending flaps to a receptacle member, said machine having means for slidably compressing the cover member onto the receptacle member, and having a platform, a pusher for moving the assembled members to a definite position on said plat-

form, and means for turning the flaps of the cover member under the receptacle member and exerting pressure thereon while in said position on the platform.

11. A machine for securing a cover member having depending flaps to a receptacle member, said machine having means for slidably compressing the cover member onto the receptacle member, and having a platform, pressure plates above the platform, means for actuating said pressure plates, and means for turning the flaps of the cover member under the receptacle member.

12. A machine for securing a cover member having depending flaps to a receptacle member, said machine having means for slidably compressing the cover member onto the receptacle member, and having a platform, pressure plates above the platform, means for actuating said pressure plates, and inwardly movable folders at opposite sides of the platform for turning the flaps of the cover member under the receptacle member.

13. A machine for securing a cover member having depending flaps to a receptacle member, said machine having means for slidably compressing the cover member onto the receptacle member, and having a platform, pressure plates above the platform, means for actuating said pressure plates, and inwardly movable carriages at opposite sides of the platform having rolls to engage the flaps of the cover member and turn them under the receptacle member.

14. A machine for securing a cover member having depending flaps to a receptacle member, said machine having means for slidably compressing the cover member onto the receptacle member, and having a platform, a stop for determining the proper position for said members on the platform, pressure plates above the platform, means for actuating said pressure plates, and means for turning the flaps of the cover member under the receptacle member.

15. A machine for securing a cover member having depending flaps to a receptacle member, said machine having a platform, a pivoted stop above the platform, releasable means for locking said stop in operative position to determine the proper position for said members on the platform, and means for turning the flaps of the cover member under the receptacle member and subjecting the whole to pressure, while in the position determined by said stop.

In testimony whereof I have affixed my signature.

HAROLD S. LABOMBARDE.