

June 8, 1926.

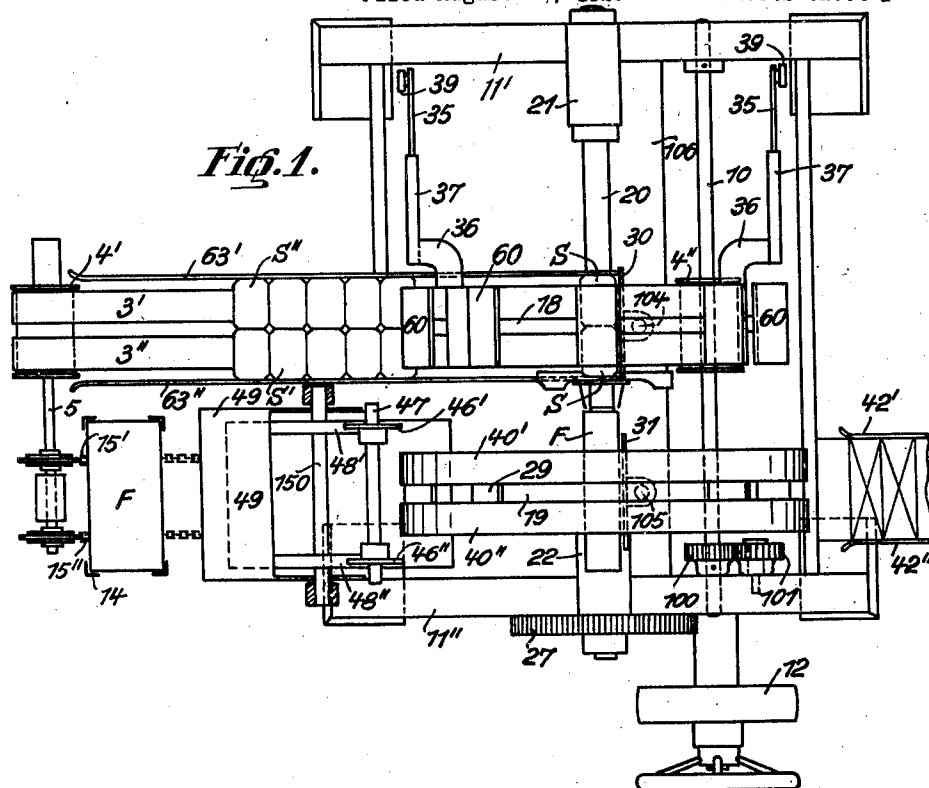
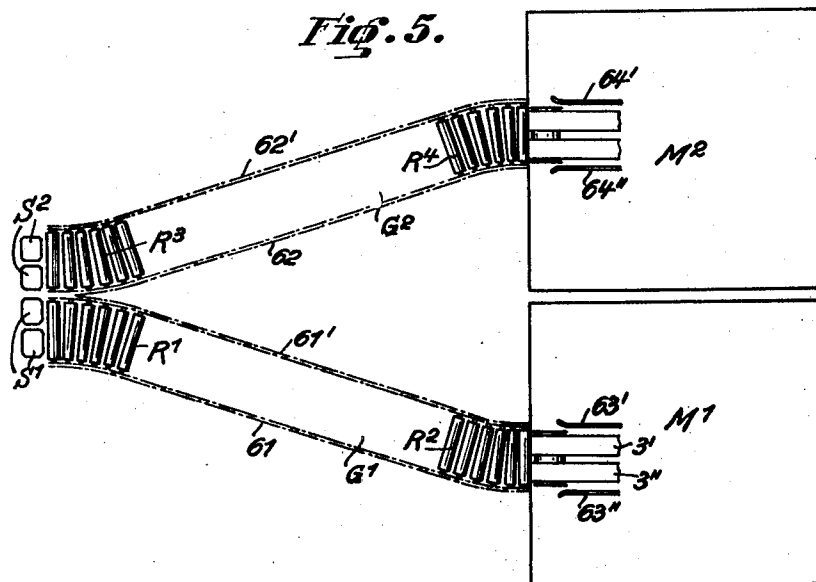
1,587,556

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MACHINE FOR WRAPPING UP PIECE GOODS

Filed August 25, 1925

4 Sheets-Sheet 1



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June 8, 1926.

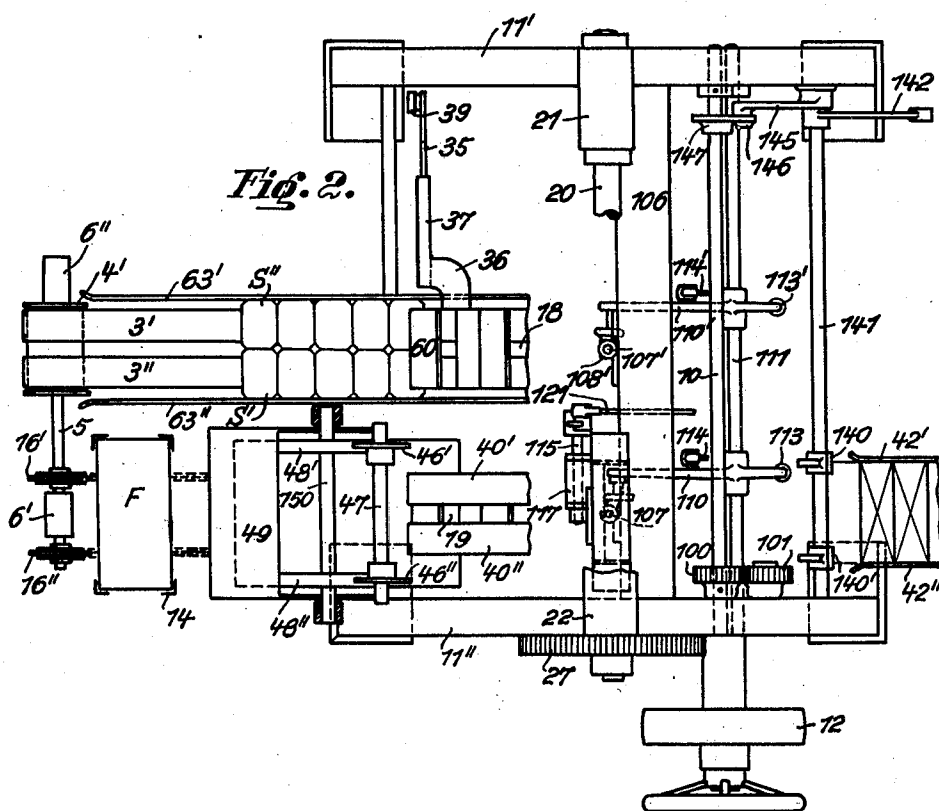
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MACHINE FOR WRAPPING UP PIECE GOODS

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4 Sheets-Sheet 2



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MACHINE FOR WRAPPING UP PIECE GOODS

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4 Sheets-Sheet 3

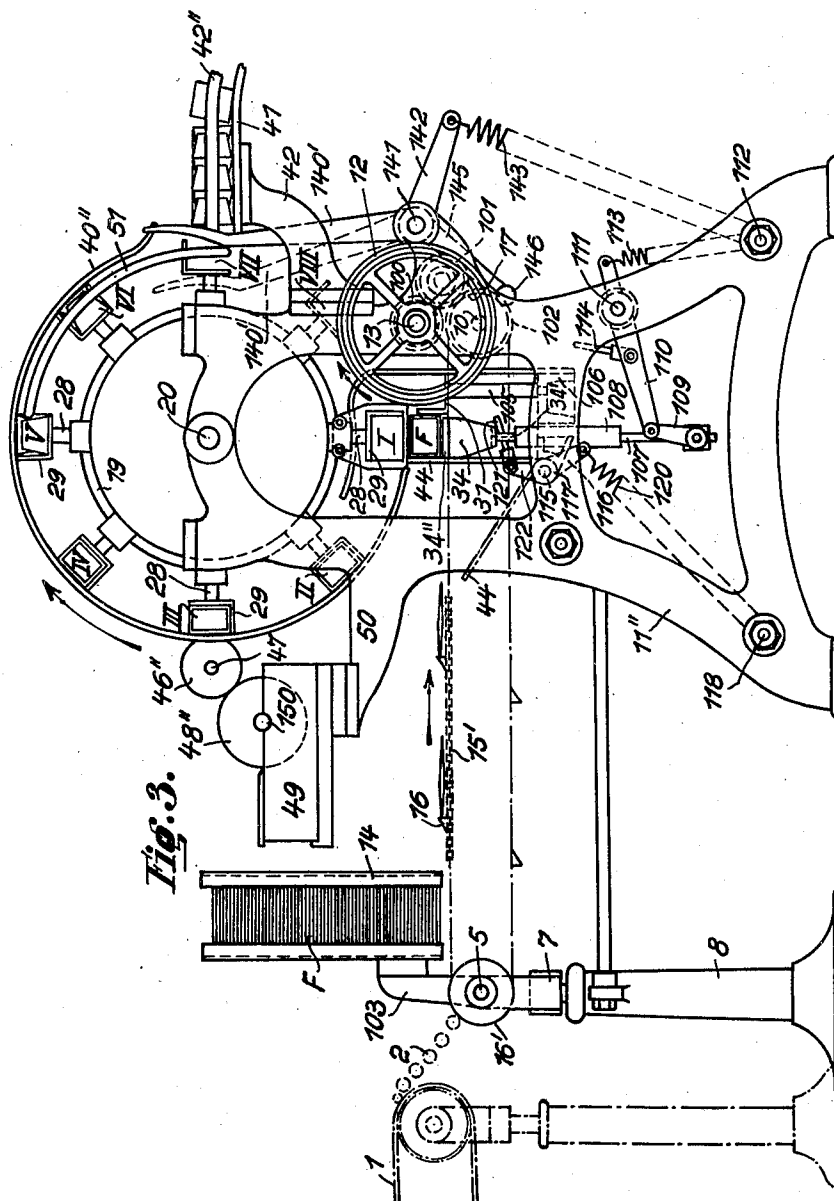


Fig. 3.

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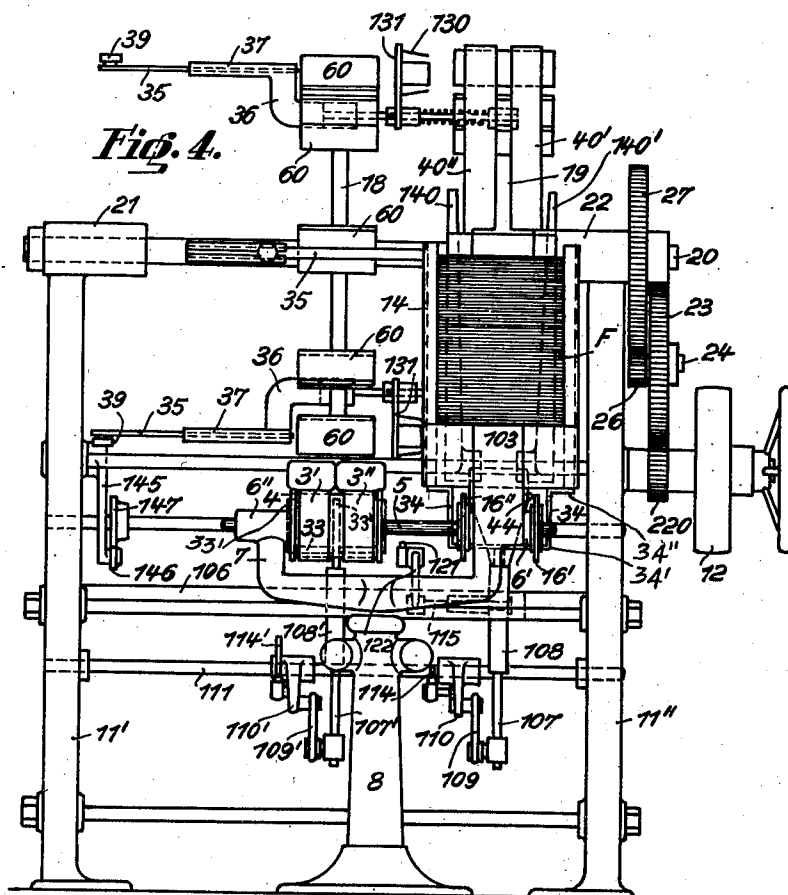
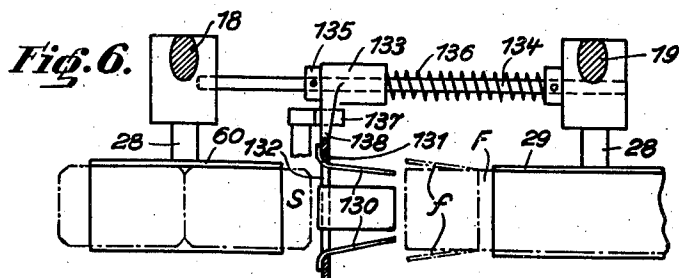
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MACHINE FOR WRAPPING UP PIECE GOODS

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4 Sheets-Sheet 4



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MACHINE FOR WRAPPING UP PIECE GOODS.

Application filed August 25, 1925, Serial No. 52,376, and in Germany March 28, 1924.

This invention relates to a machine for wrapping up piece goods, such as cakes of soap, into box-like wrappers.

The invention consists essentially in introducing the pieces to be wrapped up and the wrappers each into one of two conveyor devices located side by side and rotating simultaneously at the same speed, with an equal number of carriers located opposite each other, the pieces to be wrapped up being then pushed from their conveyor into the wrappers located opposite on the other conveyor, the closing of the wrapper and the removal of the wrapped up article then taking place from this conveyor.

The object of the invention is to produce a machine for wrapping up piece goods in box-like wrappers which combines simplicity of construction and reliability of operation with high efficiency.

In the accompanying drawings an embodiment of the invention is illustrated by way of example.

In these drawings are:

Fig. 1, a plan of a machine embodying the invention,

Fig. 2, a plan in which the upper parts of the machine have been broken away to show the lower gear more clearly,

Fig. 3, a side-elevation of the machine,

Fig. 4, a front elevation of the machine viewed from the left of Fig. 1,

Fig. 5, a diagrammatic plan of the feeding arrangement of the cakes of soap in a double plant, and

Fig. 6, a side elevation of a detail of the machine on an enlarged scale.

The embodiment of the invention illustrated is a machine which serves to wrap two cakes of soap S disposed in line or a row into a paper or cardboard box designed as folding box.

The two cakes of soap S, S may for instance be conveyed directly from a soap press of any well-known and therefore not shown kind by a continuously travelling conveyor belt 1, Fig. 3, across stepwise located rotatable rollers 2 upon two conveyor belts 3' and 3''. These belts are passed around two pulleys 4' and 4'' of which the pulley 4'' is fixed to a shaft 5 that is loosely rotatable in the bearings 6' and 6'' of a bridge 7 supported on a pillar 8. The pulley 4'' is keyed upon a shaft 10 journaled in bearings of the side frames 11' and 11'' and

is continuously rotated from a spur wheel 100 fixed upon the driving shaft 13 by means of the intermediate wheel 101 loosely rotatable upon the framework 11'' and the gear wheel 102 keyed upon said shaft 10. The drive of the machine consists of a pulley 12 which is keyed upon the said shaft 13 rotatably mounted in a suitable bearing of the framework 11'', and which is continuously rotated from a suitable source of energy by means of a belt or the like in any known manner.

The cakes of soap are enclosed in folding boxes F which are stacked, in collapsed condition, in a frame-like container 14. As clearly shown in Fig. 3 this container is secured to a bracket 103 carried by the bearing 6'. The lowermost box F of the stack is withdrawn, in the manner hereinafter described, from the container 14 by two chains 15' and 15'' travelling in the direction of the arrow, Fig. 3. Upon these chains oppositely located carriers 16 are provided, of which each pair when passing underneath the container 14 engages the lowest box F for the time being and carries it along. The chains 15', 15'' are at each end of their path laid around a pair of chain wheels, of which the pair of chain wheels 16' and 16'' is fixed upon the above mentioned shaft 5. The pair of chain wheels 17, Fig. 3, at the other end of the path is fixed upon the above mentioned shaft 10 so that the latter pair of chain wheels is continuously rotated by the already described rotation of the shaft 10 together with the pulley 4''.

At the inner ends of the belts 3', 3'' and chains 15', 15'' there are rotatably arranged above each of these travelling conveyor devices conveyor wheels 18 and 19. These two wheels are fixed upon a common shaft 20 which is journaled in the bearings 21 and 22 of the framework 11' and 11'' and is continuously rotated from the shaft 13 of the driving pulley 12. For this purpose, a spur wheel 220, Fig. 4, is keyed upon the driving shaft 13 and gears with a spur wheel 23 which is rotatably arranged upon a shaft stump 24 fixed upon the framework 11'' and transmits its rotation by means of a spur wheel 26 fixed upon its face upon a spur wheel 27 keyed upon the said shaft 20. The conveyor wheel 19 is provided with radial angular carriers 29 fixed upon its circumference by means of suitable bolts 28, Fig. 3.

The conveyor wheel 18 is in the same manner as illustrated in Fig. 3 for the conveyor wheel 19, provided with a corresponding number of carriers 60 which are fixed upon the circumference of the wheel 18 opposite the carriers 29 of conveyor wheel 19.

The feed of the pieces S and of the folding boxes F takes place up to such a position that they are situated below the lowest carriers for the time being of the conveyor wheels as is clearly shown in Fig. 3 for the conveyor wheel 19. In this position, the feed of the pieces S and the folding boxes F is arrested by angular stops 30 and 31 which as shown in Fig. 3 for the stop 31 are fixed by a bolt 104 and 105 respectively upon a bridge 106 of the frame of the machine extending between the frames 11', 11''. Below this end position of the pieces S and folding boxes F there are located reciprocating plungers 33 and 34 respectively. The plunger 34 for the folding boxes F is vertically guided in a sleeve 108 attached to the said bridge 106 by means of a rod 107. The lower end of the rod 107 is connected with a double-armed lever 110 by means of a link 109. The lever 110 is adapted to oscillate upon the connecting rod 111 of the two standards 11', 11'', and its free end is engaged by one end of a spring 113 the other end of which is attached to the connecting rod 112 of the standards 11', 11'' and which spring has the tendency to move the plunger 34 upwards by means of the linkwork described. The downwards motion of the plunger 34 against the resistance of the spring 113 takes place by means of a rod 114 engaging the lever 110 and being moved in a well-known manner by a suitable eccentric upon the shaft 10. The plunger 34 embraces a member 34' secured to the rod 107 intermediate its ends. By means of the rod 107 the member 34' is moved up and down between the upper and lower paths of the chains 15' and 15'' and beyond these paths the member 34' has two vertical upwardly extending arms which are bent horizontally outward at their upper ends, 34''. The stroke of the member 34' between the upper and lower paths of the chains 15' and 15'' is of sufficient magnitude that upon the upward movement of the plunger the boxes F may be lifted from the chains 15' and 15'' into the moving carriers 29 of the wheel 19. In exactly like manner the plunger 33 for the cakes of soap is actuated by the rod 107', link 109' double-armed lever 110' spring 113' and eccentric rod 114' from another eccentric of shaft 10. This plunger, like the plunger 34, has an intermediate part 33 which is moved up and down by the rod 107' between the upper and lower paths of the belts 3' and 3''. The intermediate part 33 is provided with vertical arms 33' between and beyond the belts, these arms being as

wide as the upwardly extending arms of the plunger 34 but being thicker than said upwardly extending arms and having no horizontal extensions at their upper ends. The stroke of the part 33 is such that upon the upward movement of the plunger the arms 33' lift the pieces of soap S from the belts 3', 3'', and convey them to the moving carriers 60 of the wheel 18''.

In the end position of the folding boxes, a lever 44 cooperates with the angular stop 31 in order to set the folded or collapsed boxes up into their rectangular shape. Said lever 44 which passes between the two chains 15', 15'' is fixed upon a bolt 115 which is rotatable in a bearing bracket 117 fixed upon the above mentioned bridge 106. Upon the said bolt 115 is fixed a lever 116 which is controlled by a spring 120 fixed upon the connecting rod 118 of the two frame standards 11', 11'', which spring has the tendency to move the lever 44 from the position indicated in broken lines into the position shown in full lines, Fig. 3. The opposite motion is imparted to the lever 44 by means of an eccentric rod 121 which is moved in a well-known manner by a suitable eccentric of the shaft 10 and transmits its motion upon the bolt 115 by a lever arm 122.

For each of the carriers 60 of the conveyor wheel 18 a device is provided by means of which the cakes of soap are pushed from the respective carrier into the wrapper located in the opposite carrier of the conveyor wheel 19. This device consists in the present case of rods 35 which are adapted to be reciprocated in guides 37 fixed upon the wheel 18 by means of arms 36, Figs. 1 and 4. The to and fro motion of the rods 35 in the guides 37 is effected by means of guide bowls 39 fixed upon the outer end of said rods 35 and running in a suitably shaped groove provided upon the inner side of a ring, not shown, which is fixed upon the standard 11'.

There is furthermore provided for each carrier 60 between it and the opposite carrier 29 a mouthpiece which serves the purpose of guiding the cake of soap S safely into the oppositely located box of the conveyor wheel 19 when the cake of soap is pushed out of its respective carrier 60.

Each of these mouthpieces or funnels, Fig. 6, is preferably formed of four tongues 130 of steel or other resilient material which are attached to a frame element 131 with an opening 132 for the entrance of the cakes of soap. These tongues 130 converge slightly and extend towards the opposite carrier 29 of the conveyor wheel 19. During the insertion process, the respective mouthpiece is introduced into the flaps f of the box F in the direction of the carrier 29. For this purpose, each of the frames 131 with a sleeve 133 is adapted to slide along but not to turn

on a rod 134, said rods 134 connecting the two conveyor wheels 18 and 19. The frame 131 is controlled by a helical spring 136 which forces the sleeve 133 against a collar 135 fixed upon the rod 134 and thus normally holds the mouthpiece in the position shown in Fig. 6. At the place where the cake of soap passes into the mouthpiece there is, however, secured to the machine frame a stationary cam 137, Fig. 6, which at the proper moment effects the displacement of the mouthpiece 131 against the resistance of the spring 136 by means of the arm 138 connecting the mouthpiece 131 with collar 133.

Around the conveyor wheel 19 there are provided curved rails 40', 40'' conforming to the path described by the carriers of this conveyor wheel which rails are fixed upon the frame of the machine and extend from the place of introduction of the pieces into the wrappers indicated by I, Fig. 3, up to the place of discharge marked VII.

For discharging the finished packed up goods two levers 140, 140' are provided which are fixed upon the shaft 141 journaled in the standards 11', 11'' of the machine and which extend at both sides of the conveyor wheel 19. Upon the shaft 141 is fixed an arm 142 the end of which is engaged by a tension spring 143 which is connected with its other end to the transverse rod 112 of the machine, and which has the tendency to turn the levers 140, 140' from the position indicated in broken lines in Fig. 3 into the position shown in full lines. Upon the shaft 141 there is also fixed a lever 145 which with a guide bowl 146 is kept in engagement with an eccentric 147 upon the shaft 10 by means of the spring 143 acting upon arm 142. Owing to the shape of the eccentric 147 the levers 140, 140' are ordinarily kept in the inoperative inner position indicated in dotted lines in Fig. 3. The conveyance of the finished packages takes place in a gutter or trough which consists of the bottom rail 41 fixed upon the bracket 42 attached to the standard 11'' and the side rails 42', 42''.

The improved machine operates in the following manner:

By means of the continuously travelling conveyor belts 3', 3'' two aligned cakes of soap S, S placed side by side are advanced in the direction of the conveyor wheel 18 and by the chains 15', 15'' a folding box F in the direction of the conveyor wheel 19. As soon as the folding box F abuts against the stop 31, the lever 44 is turned upwards by its described operating mechanism from the inoperative position shown in broken lines into the vertical operative position shown in Fig. 3, and hereby the collapsed folding box F is raised into a box of rectangular cross-section, as is also shown in

Fig. 3. The cakes of soap to be packed into this box abut against the stop 30, Fig. 1. Now the plungers 33 and 34 are pushed upwards by their operating mechanism herebefore described, and the box F is hereby pushed into the passing carrier 29 of the conveyor wheel 19 and the two cakes of soap into the passing carrier 60 of the conveyor wheel 18. The wheels 18 and 19 continue to rotate, as already described. After the box and the cakes of soap have been inserted the push rod 35 belonging to the just charged carrier of the supply wheel 18 is moved into the folding box located in the opposite carrier 29 by means of the guide roller 39 and the curved groove not illustrated, as set forth above. Hereby the mouthpiece 130 of this carrier is moved towards the supply wheel 19, the springy tongues 130 of the mouthpiece entering into the opening facing them of the opposite wrapper so that the two cakes of soap are safely introduced into the respective box of the conveyor wheel 19 whereupon the rod 35 recedes again. During the further rotation of the two wheels 18 and 19 the adhesive is applied to the closure flaps at the two ends of the folding box by the passing of the box past the two discs 46' and 46'' for applying the adhesive. These discs are mounted on a rotatably supported shaft 46 and in contact with the rollers 48', 48'' which are mounted on a shaft 150 journaled in the side walls of the tank 49 containing the adhesive. The rollers 48', 48'' are kept in continuous rotation by a belt drive not illustrated as it is well-known. The tank containing the adhesive 49 is mounted on a bracket 50 of the frame standard 11''. During the further rotation of the two conveyor wheels, folding devices located at both sides of the conveyor wheel 19 come into operation. These devices have not been illustrated as they are well-known and any suitable type may be employed. These devices first fold the two head flaps which in the direction of rotation are located at the front and at the back of the two ends of the wrapper to be closed. Then the two head flaps provided with adhesive are folded over and finally the two internally located head flaps. The closure of the two ends of the box is finished when the carrier has reached the position V. The box now enters with its ends between two curved side rails 51 fixed at both sides of the circular path, by which rails the head flaps are pressed together firmly and are prevented from bursting open. When the carrier has reached the position indicated by VII, the finished box with its contents is ejected from the carrier by the above described movement of the levers 140, 140' and placed upon the rail 41 and between the side rails 42' and 42'' which latter effect a

further pressing together of the two end seals of the package.

Although two cakes of soap are packed into one box, wrapper or folder on the machine illustrated by way of example, it will be readily understood that only one piece or more than two pieces may be wrapped up in a similar manner. Instead of folding boxes finished cardboard boxes or similar envelopes may be used which may be already closed at one end so that the packing machine has only to close the other open end. The closing of the wrappers may also be effected in any other suitable manner. Instead of the conveyor wheels 18 and 19 other suitable apparatus may be employed, such as travelling chains with suitable carriers or grippers.

A special advantage of the construction of the machine as described resides in the fact that the conveyor or supply wheels and the other conveying devices can be run continuously and without the necessity of stopping them at any time whereby a high output of the machine is attained. The machine may, however, be carried out also in such a manner that the rotation of the conveying devices takes place intermittently or stepwise. It would then be sufficient to provide at the place where the goods to be packed pass from one wheel on to the other only a single stationary ejecting and mouth-piece device which is common to all the carriers of the conveyor or supply wheel 18 instead of providing each of the carriers of the wheel 18 with an ejecting and guiding device of its own.

Machines of this kind may also be arranged in pairs in cooperation with a single soap press in order to increase the output of the plant. the press then producing simultaneously the necessary number of cakes of soap for two packages. Such an arrangement is shown by way of example and diagrammatically in plan in Fig. 5, two cakes of soap again abutting with their end faces and being arranged in a row and both being wrapped into a common wrapper. The soap press manufactures in this case four cakes simultaneously of which the cakes S^1 , S^1 are conveyed to the wrapping machine M^1 by a conveyor belt C^1 and the cakes S^2 , S^2 to the machine M^2 by a conveyor belt C^2 . The two conveyor belts C^1 , C^2 diverge fork-like from the soap press to the wrapping machines M^1 , M^2 . The passage of the cakes of soap from the press on to the two conveyor belts on the one hand and from the conveyor belts into the wrapping machines is effected by means of rollers R^1 , R^2 , R^3 , R^4 which are journaled under the necessary angle to each other at the places where the direction of travel changes. The lateral guidance of the cakes of soap takes place by means of rails 61, 61', 62, 62' arranged at

both sides of the path of travel and which within the wrapping machines are continued by the guide rails 63', 63'' and 64', 64'' located at both sides of the conveyor belts 3', 3''. The machines M^1 and M^2 may be constructed as described with reference to Figs. 1 to 4.

It will be readily understood that the details of construction of the machine and the arrangement of parts may be altered and changed in various ways without departing from the spirit and ambit of the invention, and I do not desire to be limited by anything but the state of the art and the appended claims.

What I claim as my invention and desire to secure by Letters Patent is:—

1. In a machine for wrapping up piece goods, particularly cakes of soap, into box-like wrappers, in combination, a travelling conveyor element for transporting the pieces to be wrapped up, a travelling conveyor element for transporting the wrappers, stops for arresting the pieces and wrappers, means for raising said pieces and wrappers, two rotary conveyor devices located above said travelling conveyor elements, and adapted to rotate simultaneously and at the same speed, an equal number of aligned carriers upon said rotary conveyor devices and into which the pieces to be wrapped up and the wrappers are pushed up by said raising devices, means for displacing the pieces to be wrapped up from the carrier of their rotary conveyor into the wrappers located oppositely in the carrier of the other rotary conveyor device, means for effecting the closure of the packages on said second rotary conveyor device and means for effecting the removal of the finished packages from said second conveyor device.

2. In a machine for wrapping up piece goods into folding boxes, in combination a travelling conveyor element for the pieces to be wrapped up, a travelling conveyor element for the wrappers, stops for arresting the pieces and wrappers, a member cooperating with the stop for the wrappers, means for moving said member towards said stop in such a manner that the flat folding box is put into its rectangular shape between said member and said stop, two rotating conveyor devices located above said travelling conveyor elements and adapted to rotate simultaneously and at the same speed, an equal number of aligned carriers upon said rotary conveyor devices, means for raising said pieces and said wrappers from their travelling conveyers into said carriers upon said rotating conveyers, means for displacing the pieces to be wrapped up from the carrier of their rotary conveyor into the wrappers located oppositely in the carrier of the other rotary conveyor, means for effecting the closure of the packages on said second rotary

conveyor, means for effecting the removal of the finished packages from said second conveyor and conveying means for receiving the finished packages.

- 5 3. In a machine for wrapping up piece goods, in particular cakes of soap, into box-like wrappers, in combination a travelling conveyor element for transporting the pieces to be wrapped up, a travelling conveyor ele-
 10 ment for transporting the wrappers, stops for arresting the pieces and wrappers, means for raising said pieces and wrappers, two rotary conveyor devices located above said travelling conveyor elements and
 15 adapted to rotate simultaneously and at the same speed, an equal number of aligned carriers upon said rotary conveyor devices and into which the pieces to be wrapped up and the wrappers are pushed up by said raising
 20 devices, each of said carriers for the reception of the piece goods being provided with a sliding device adapted to effect the displacement of said pieces from their carrier and their introduction into the opposite
 25 carrier of the other rotary conveyor device, and means for effecting the closure of the packages in and their removal from said second rotary conveyor device.

4. In a machine for wrapping up piece goods, particularly cakes of soap, into box- 30 like wrappers, in combination, two rotary conveyor devices located side by side and adapted to rotate simultaneously and at the same speed, an equal number of aligned carriers upon each of said rotary conveyors 35 and adapted to receive the pieces to be wrapped up and the wrappers, a mouthpiece for each carrier of the conveyor for the pieces located between its own carrier and the opposite carrier of the other con- 40 veyor for the wrappers, said mouthpiece having tongues directed towards the carrier of the other conveyor and being adapted to be displaced in the direction of the wrapper contained therein so that said tongues en- 45 gage the opposite edge of the wrapper during the process of insertion, a sliding device adapted to effect the displacement of said pieces through said mouthpiece into the op- 50 posite carrier of the other rotary conveyor device, and means for effecting the closure of the packages in and their removal from said second rotary conveyor device.

In testimony whereof I have affixed my signature.

GUSTAV SCHILBACH.