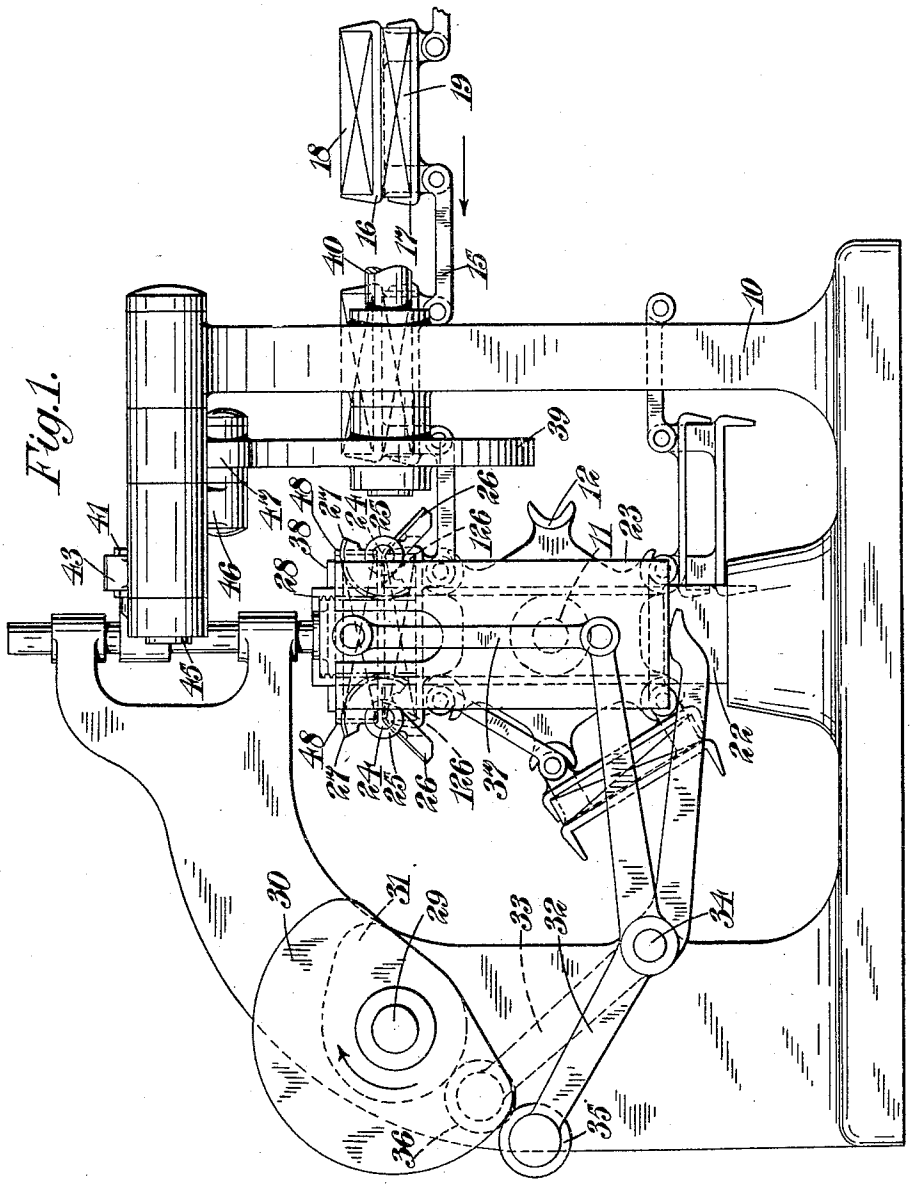
Nov. 1, 1932. A. G. ROSE 1,886,122

MACHINE FOR PACKING ARTICLES INTO BOXES

Filed March 3, 1931 3 Sheets-Sheet 1

Fig. 1.



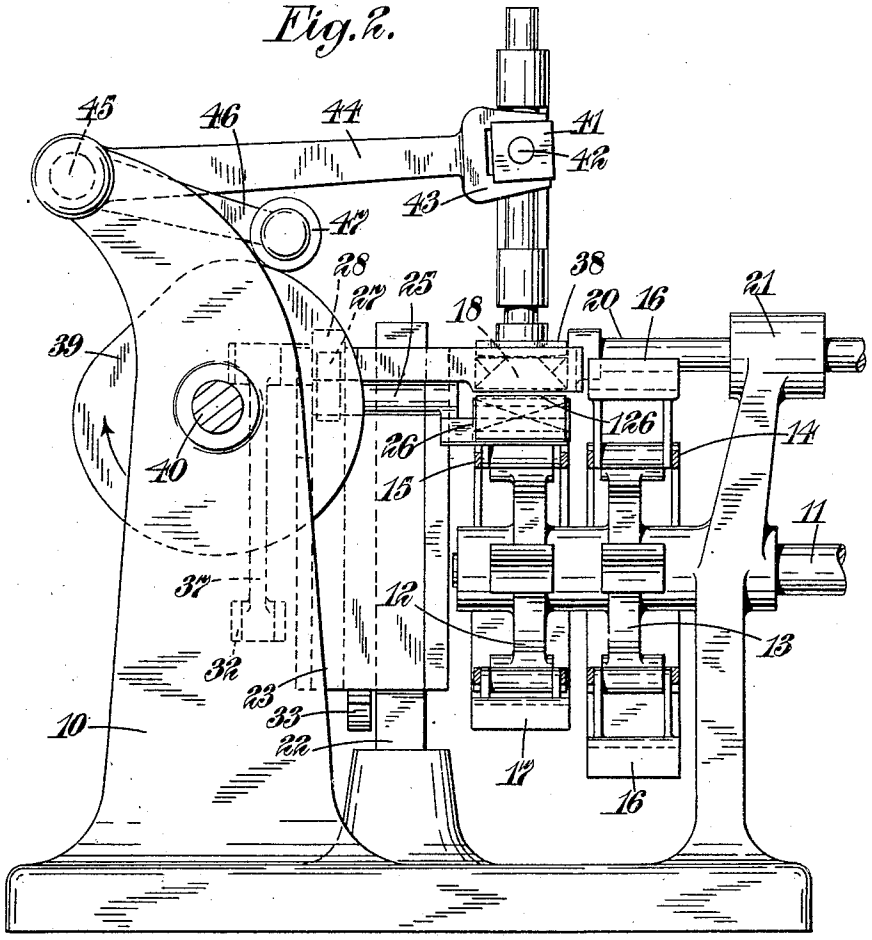
Inventor
Alfred G. Rose
by
Byrnes, Stebbins, Parmelee & Blenko
attys.

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MACHINE FOR PACKING ARTICLES INTO BOXES

Filed March 3, 1931 3 Sheets-Sheet 2

Fig. 2.



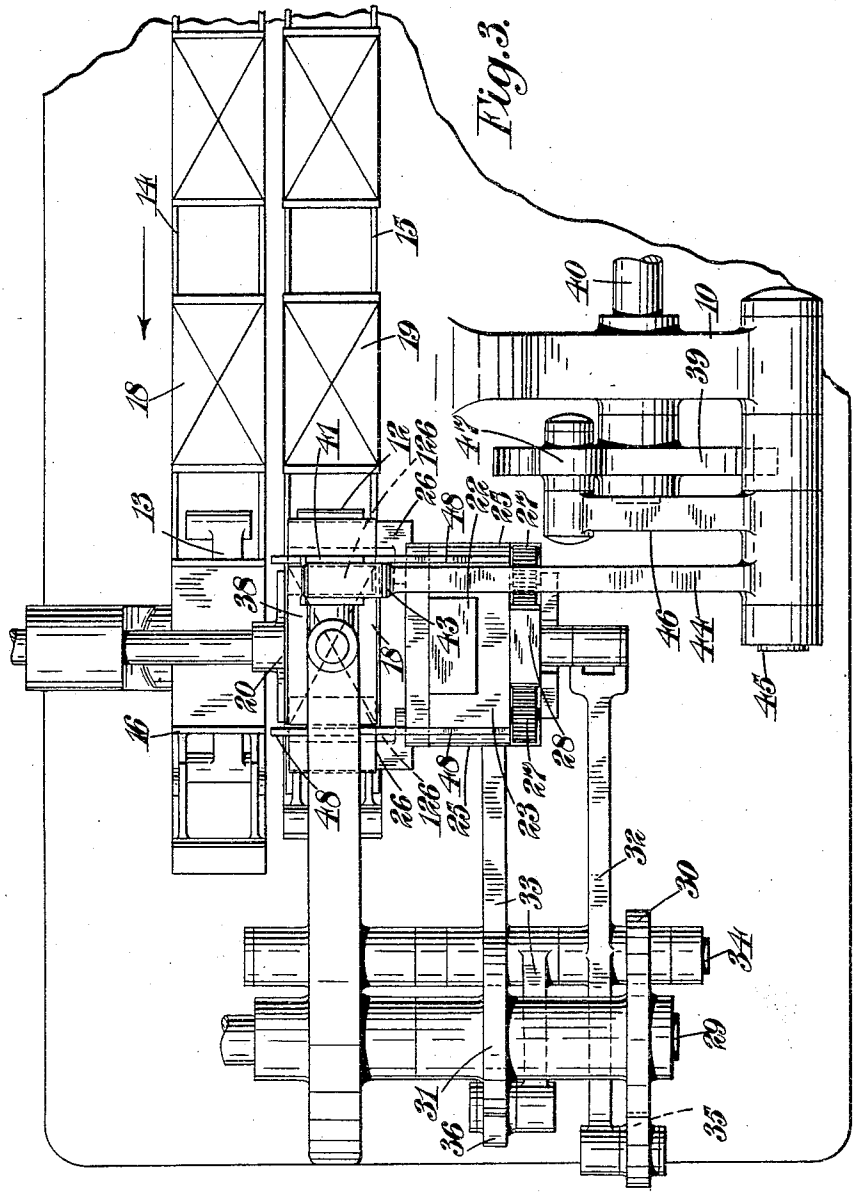
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by
Byrnes, Stebbins, Parmelee & Blenko
attys

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MACHINE FOR PACKING ARTICLES INTO BOXES

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Fig. 3.



Inventor
Alfred G. Rose
by
Byrnes, Stebbins, Parmelee & Blanke
attys

Patented Nov. 1, 1932 1,886,122

UNITED STATES PATENT OFFICE

ALFRED GERMAN ROSE, OF GAINSBOROUGH, ENGLAND, ASSIGNOR TO ROSE BROTHERS (GAINSBOROUGH) LIMITED, OF GAINSBOROUGH, ENGLAND, A BRITISH COMPANY

MACHINE FOR PACKING ARTICLES INTO BOXES

Application filed March 3, 1931, Serial No. 519,860, and in Great Britain March 13, 1930.

This invention is for improvements in or relating to machines for packing articles into boxes or similar receptacles, and is chiefly concerned with the provision of improved mechanisms whereby an article may be introduced into a box or other receptacle, the internal dimensions of which slightly exceed the extenal dimensions of the article.

This invention relates to packing machines of the type in which a succession of open boxes and a succession of articles to be placed in them are brought, one box and one article at a time, to a filling station at which an article is supported above the open mouth of a box by hinged blades which are movable between two positions, a first position in which they lie substantially in a common horizontal plane above the open mouth of a box located at the filling station and serve to support an article, and a second position in which they lie in substantially vertical planes and constitute guides for the insertion of the article into the hox.

The primary object of the present invention is to improve generally and to simplify machines of the aforesaid kind, and another object is to provide means whereby the articles will be guided completely into the boxes.

The invention consists in certain novel combinations and arrangements of parts which will be fully described hereinafter and specifically pointed out in the accompanying claims.

One construction according to the present invention will now be described in detail by way of example with reference to the accompanying drawings in which

Figure 1 is a side elevation of a packing machine according to the present invention,

Figure 2 is an end elevation of the machine shown in Figure 1 and looking in the direction of the arrow, and

Figure 3 is a plan of the machine shown in Figures 1 and 2.

Throughout this description like reference numerals indicate like parts.

The machine consists of a framework 10 in which is supported a shaft 11 carrying two sprockets 12 and 13. Around these sprockets two chain conveyors 14 and 15 run, each chain conveyor carrying a number of pockets 16 and 17 respectively. The shaft 11 is rotated intermittently by any suitable mechanism such as a Geneva stop mechanism to bring the pockets 16 and 17 in succession to a position directly above the sprockets which position may be termed the filling station. The pockets 16 contain articles or packages 18 and the pockets 17 open mouth boxes 19. It will be observed from Figures 1 and 2 that these pockets are so positioned on their chain conveyors that each article or package 18 is supported with its undersurface slightly above the plane of the box mouth 19.

Above the parallel to the shaft 11 is a plunger 20 supported in a suitable bearing 21 on the machine frame 10, and this plunger may be reciprocated while the sprockets 12 and 13 are stationary to push that article 18 which has been brought to the filling station out of its pocket 16 to a position immediately above the box 19 which is at the filling station. At the opposite side of the sprockets from the plunger 20 is a vertical guide 22 on which a rectangular frame or carrier 23 is slidably mounted. Pivotally mounted by means of spindles 24 in bosses 25 on the carrier 23 are two blades 26. The axes of these spindles 24 are in line with the upper edges of two opposed sides of that box 19 which is presented at the filling station, and the blades are substantially L-shaped as shown in Figure 1. The long arm of the L in each case extends from the end of its spindle 24 along a side of the box while the short arm of the L (which in fact forms the blade proper and is numbered 126) extends over the open mouth of the box. This extension of the blade over the box is shown clearly in Figures 1 and 3.

In the position shown in Figure 1, these blades 26 are horizontal and form supports for that article 18 which, as shown in Figures 2 and 3, has been moved out of its pocket 16 by the pusher 20 and over the box 19 at the filling station. At the end of each spindle 24 remote from the blade 26 is a toothed quadrant 27, and these quadrants are engaged by a double rack 28 which slides vertically

in guides in the carrier 23. Vertical movement of the carrier 23 and the double rack 28 is effected as follows:

A shaft 29 is supported in bearings in the frame 10 at right angles to the above mentioned shaft 11, and this shaft 29 carries two cams 30 and 31. Two bell-crank levers 32 and 33 respectively co-operate with the cams 30 and 31, and are pivoted for movement about a shaft 34. These bell-crank levers carry cam followers 35 and 36. The bell-crank lever 32 at its end remote from the cam follower 35 is joined by a pivoted link 37 to the double rack 28, while the end of the bell-crank lever 33 remote from the cam follower 36 engages under the carrier 23. It will be appreciated, therefore, that the carrier 23 and the double rack 28 may be raised and lowered together or separately according to the design of the cams 30 and 31. In the accompanying drawings, the carrier 23 is shown in its lowest position, while the double rack 28 is shown in its highest position. Initial movement of the cam 30, in the direction of the arrow, from the position shown in Figure 1, causes the double rack 28 to be lowered, and this movement swings the blades 26 through approximately 90° so that the portions 126 occupy substantially vertical and parallel planes inside that box which is positioned at the filling station, each blade portion 126 being adjacent to one of two opposed sides of the box. In this position, the blade portions 126 serve as guides to guide the article 18 positioned above the box into it when the article is forced downwards by a charging plunger 38. This plunger 38 is movable vertically in bearings in the machine frame by means of a cam 39 mounted on a shaft 40 and rotatable in the direction of the arrow shown in Figure 2. A block 41 is rotatably mounted on a pin 42 which projects at right angles to the stem of the plunger 38. This block is slidably engaged in a fork 43 on one end of lever 44. The lever 44 is pivotally mounted on a pin 45 on the machine frame, and is attached to a second lever 46 which carries a cam follower 47 making contact with the cam 39.

Two guide plates 48 are mounted on the carrier 23 above the position at the filling station which is occupied successively by boxes 19 and extend horizontally in parallel and vertical planes from this carrier to that position at the filling station which is occupied successively by the articles 18, and serve to guide each article 18 during its transfer by the pusher 20 from the pocket 16 on to the blades 26 when the latter are in their first or horizontal position.

The various cam followers may be maintained in contact with their respective cams by springs, which are not shown.

The operation of the packing machine is as follows:—

The shaft 11 is rotated intermittently to bring an article 18 and a box 19 to the filling station, the blades 26 being in their first position (i. e. the carrier 23 being in its lowest position and the double rack 28 being in its raised position). The pusher 20 is now operated to move the article 18 between the guides 48 on to the horizontal blades 126. In the drawings the apparatus is shown at this stage. Subsequent rotation of the shaft 29 and cam 30 causes the double rack to be lowered, thus turning the blades 126 into their second or vertical position. At or about the same time the charging plunger 38 is lowered by the cam 39 and presses the article 18 between the blades 126 into the box 19. Immediately afterwards the cams 30 and 31 cause the carrier and the double rack 28 to be lifted together. This movement withdraws the blades 126, while still in their vertical position, from between the article and the sides of the box. The plunger 38 is now raised and at or about the same time the carrier 23 is lowered by the cam 31. The double rack, however, is maintained in its raised position and the blades 126 are, therefore, returned to their first or horizontal position. Subsequently, the shaft 11 and the sprocket wheels 12 and 13 are rotated to remove the filled box 19 from the filling station and to feed up a further article and an empty box.

In a modified construction the guide plates 48 and the portions 126 of the blades are slotted to give a comb-like effect there being three teeth (which are of substantial width) and two slots in each guide plate and in the blade associated with it. The guide plates, however, are not mounted on the carrier 23 but are mounted on the machine frame and are thus stationary. The slots and teeth are so arranged that two teeth on each blade portion pass, during the pivotal movement of the blades, through the two slots in the associated guide plate, the third tooth on each blade portion being arranged to swing past that end of the associated guide plate which is near the pusher 20. This arrangement permits the blades to be moved up and down and also swung without fouling the stationary guide plates. If desired in this modified construction the guide plates 48 may be carried on a stationary bracket which serves as a stop against which each article 18 is in turn pushed during its transfer by the pusher 20.

I claim:

1. In a packing machine of the kind in which a succession of open boxes and a succession of articles to be placed in them are brought one box and one article at a time to a filling station at which an article is supported above the open mouth of a box by hinged blades which can be turned into substantially vertical planes to permit the passage of an article between them, the combination of a movable

blade-carrier, a plurality of blades pivotally mounted thereon to form a horizontal platform, means for positioning an open box below the blades and an article on the platform constituted by the blades, means for turning the blades into substantially vertical positions in which they extend to approximately the bottom of the box so as to guide the article completely into the box, and means for raising the carrier and the blades in relation to the box subsequent to said insertion and while the blades are still in their vertical positions to withdraw them from the box.

2. In a packing machine of the kind in which a succession of open boxes and a succession of articles to be placed in them are brought one box and one article at a time to a filling station at which an article is supported above the open mouth of a box by hinged blades which can be turned into substantially vertical planes to permit the passage of an article between them, the combination at the filling station of a movable blade-carrier, a plurality of blades pivotally mounted on it for movement about substantially horizontal axes, means for moving said blades between two positions, a first position in which they lie in substantially horizontal planes and serve to support an article above the box and a second position in which they lie in substantially vertical planes inside the box and extend to approximately the bottom of the box so as to guide the article completely into the box, a charging plunger, means for moving said plunger towards the box to force the article into it, means for moving the blades simultaneously with the charging movement of the plunger each from its substantially horizontal to its substantially vertical position, and means for moving the carrier and the blades upwardly with respect to the box and subsequent to the insertion of an article into it to remove the blades from the box.

3. In a packing machine comprising means for positioning an article over an open-topped container and for pushing the article down into it, a support platform for the article comprising a plurality of pivoted blades, means to turn the blades into substantially vertical positions in which they lie within the container and adjacent to the sides thereof to form a guide for the article during its downward movement, the combination of means for lifting the blades vertically from the container subsequent to the insertion of the article, means for moving them again to a horizontal position, and means for moving them while in the horizontal position down to their original level.

4. In a packing machine comprising means for positioning an article over an open-topped container and for pushing the article down into it, a support platform for the article comprising a plurality of blades, means to turn the blades into substantially vertical positions in which they lie within the container and adjacent to the sides thereof to form a guide for the article during its downward movement, the combination of a blade-carrier on which said blades are pivotally mounted, means for lifting the carrier and the blades vertically in respect of the container subsequent to the insertion of the article, means for turning the blades again to a horizontal position, and means for moving the carrier and the blades to bring the latter to their original level.

5. In a packing machine the combination of an intermittently movable conveyor carrying pockets for open-topped boxes and operable to bring said boxes one at a time to a charging station, a second intermittently movable conveyor carrying pockets for the articles to be packed, means for discharging the articles one after another from the second conveyor to a position in which an article so discharged is located above that open box which is at the charging station, a support platform for said article comprising a plurality of pivotally mounted blades, a movable carrier on which said blades are pivoted, means for turning the blades into substantially vertical positions in which they lie within the box adjacent to the sides thereof and extend approximately to the bottom of the box, means for forcing the said article down between the blades into the box, means for lifting the carrier vertically to withdraw the blades, and means for turning the blades back to the horizontal position.

6. In a packing machine of the kind in which a succession of open boxes and a succession of articles to be placed in them are brought one box and one article at a time to a filling station at which an article is supported above the open mouth of a box by hinged blades which can be turned into substantially vertical planes to permit the passage of an article between them, the combination of a movable blade-carrier, a plurality of blades pivoted thereon for movement about substantially horizontal axes, a toothed quadrant attached to each blade, a double rack meshing with both quadrants, means for bringing an open-topped box below said hinged blades when in position for supporting an article, means for bringing an article on to said blades, means for moving said rack and thus turning the blades into substantially vertical positions in which they extend approximately to the bottom of the box, means for lifting the blades vertically from the box after the insertion of an article, and means for turning the toothed quadrants to return the blades to a horizontal position.

7. In a packing machine of the kind in which a succession of open boxes of less depth than length or width and a succession of ar-

ticles to be placed in them are brought one box and one article at a time to a filling station at which an article is supported above the open mouth of a box and is then inserted therein, the combination of a vertically movable blade-carrier, two blades pivoted thereon about parallel and substantially horizontal axes to support when horizontal opposite ends of an article, means for positioning an open-topped box below said blades and an article on the blades, means for turning the blades into substantially vertical positions in which they lie within the box adjacent to opposed sides of it, and extend approximately to the bottom of the box, means for pushing an article between the blades into the box, means for raising the carrier to lift the blades from the box, means for lowering the carrier, and means operated by the lowering movement of the carrier to return the blades to their original horizontal position.

8. In a packing machine the combination of means for positioning an article over an open-topped box and for pushing the article down into it, a substantially horizontal collapsible support platform for the article above the box comprising two blades pivoted about parallel and substantially horizontal axes, a movable carrier on which said blades are so pivoted, a toothed quadrant attached to each blade, a double rack meshing with the two quadrants and guided for vertical movement in respect to the carrier, means for lowering the rack independently of the carrier and thus turning said blades into substantially vertical positions in which they lie inside the box adjacent to two opposed sides thereof, means for raising the carrier and rack in unison subsequent to the insertion of the article into the box to withdraw the blades therefrom, and means for lowering the carrier only to bring the blades back to their horizontal position aforesaid.

9. In a packing machine the combination of means for positioning an article over an open-topped box and for pushing the article down into it, a substantially horizontal collapsible support platform for the article above the box comprising two blades pivoted about parallel and substantially horizontal axes, a movable carrier on which said blades are so pivoted, a vertical guide track in said carrier, a toothed quadrant attached to each blade, a double rack meshing with the two quadrants and movable in said guide track, means for lowering the rack independently of the carrier and thus turning said blades into substantially vertical positions in which they lie inside the box adjacent to two opposed sides thereof, means for raising the carrier and rack in unison subsequent to the insertion of the article into the box to withdraw the blades therefrom, and means for lowering the carrier only to bring the blades back to their horizontal position aforesaid.

10. In a packing machine the combination of means for positioning an article over an open-topped box and for pushing the article down into it, a substantially horizontal collapsible support platform for the article above the box comprising two blades pivoted about parallel and substantially horizontal axes, a vertical pillar, a carrier slidably mounted thereon to which carrier said blades are pivoted, a vertical guide track in said carrier, a toothed quadrant attached to each blade, a double rack meshing with the two quadrants and movable in said guide track, means for lowering the rack independently of the carrier and thus turning said blades into substantially vertical positions in which they lie inside the box adjacent to two opposed sides thereof, means for raising the carrier and rack in unison subsequent to the insertion of the article into the box to withdraw the blades therefrom, and means for lowering the carrier only to bring the blades back to their horizontal position aforesaid.

11. In a packing machine the combination of means for positioning an article over an open-topped box and for pushing the article down into it, a substantially horizontal collapsible support platform for the article above the box comprising two blades pivoted about parallel and substantially horizontal axes, a movable carrier on which said blades are so pivoted, a toothed quadrant attached to each blade, a double rack meshing with the two quadrants and guided for vertical movement in respect of the carrier, means for lowering the rack independently of the carrier and thus turning said blades into substantially vertical positions in which they lie inside the box adjacent to two opposed sides thereof, two cams, a follower for each cam, a connection between one follower and the rack, and a connection between the other follower and the carrier, which cams are so shaped as to effect the following sequence of operations:

(*a*) The lowering of the rack to turn the blades from the horizontal to the vertical,

(*b*) The lifting of both the carrier and the rack to lift the blades while still in their vertical positions from the interior of the box, and

(*c*) The lowering of the carrier only to return the blades to their original horizontal position.

12. In a packing machine the combination of a substantially horizontal collapsible support platform, an intermittently movable conveyor for bringing open-topped boxes, one at time to a position beneath said platform, a second intermittently movable conveyor for bringing articles one at a time to a position adjacent to said platform in which position the under-surface of said article is substantially on a level with the platform, a movable carrier, two vertically opposed guide

plates mounted on the carrier and extending across the platform towards the second conveyor, a pusher for pushing each article in turn from the second conveyor between the guide plates on to the platform, two blades which constitute the platform pivoted about parallel and substantially horizontal axes on the carrier, means for turning the blades each through some 90° into the positions in which they lie within the box adjacent to two opposed sides thereof and extend approximately to the bottom of the box, a charging plunger for forcing the article down between the blades into the box, means for lifting the carrier and the blades vertically subsequent to the downward movement of the charging plunger to withdraw the blades from the box and means for restoring said blades to their original horizontal position.

In testimony whereof I have signed my name to this specification.

ALFRED GERMAN ROSE.