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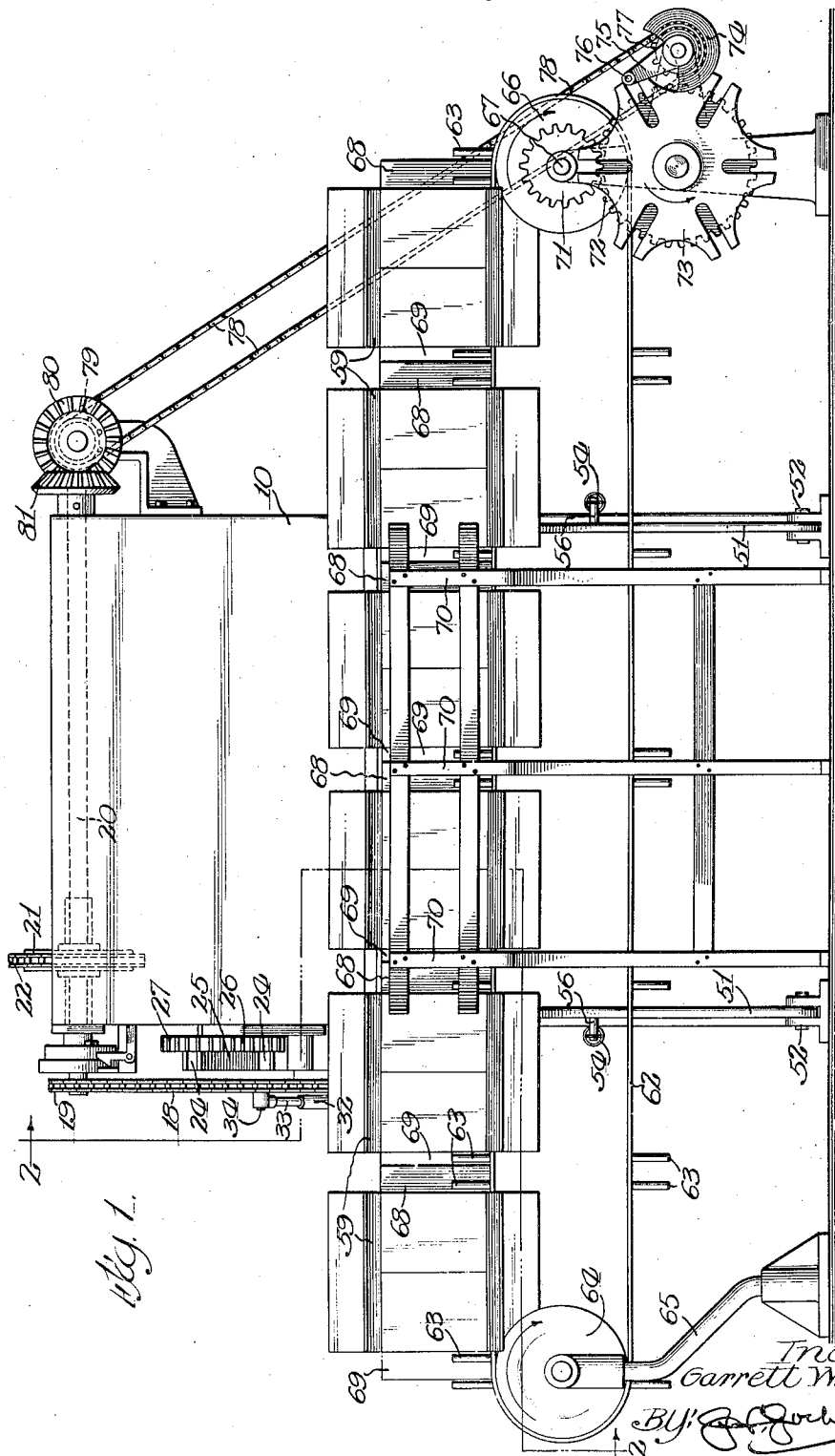
G. W. MUDD

1,987,789

PACKAGING MACHINE

Filed Aug. 31, 1928

4 Sheets-Sheet 1



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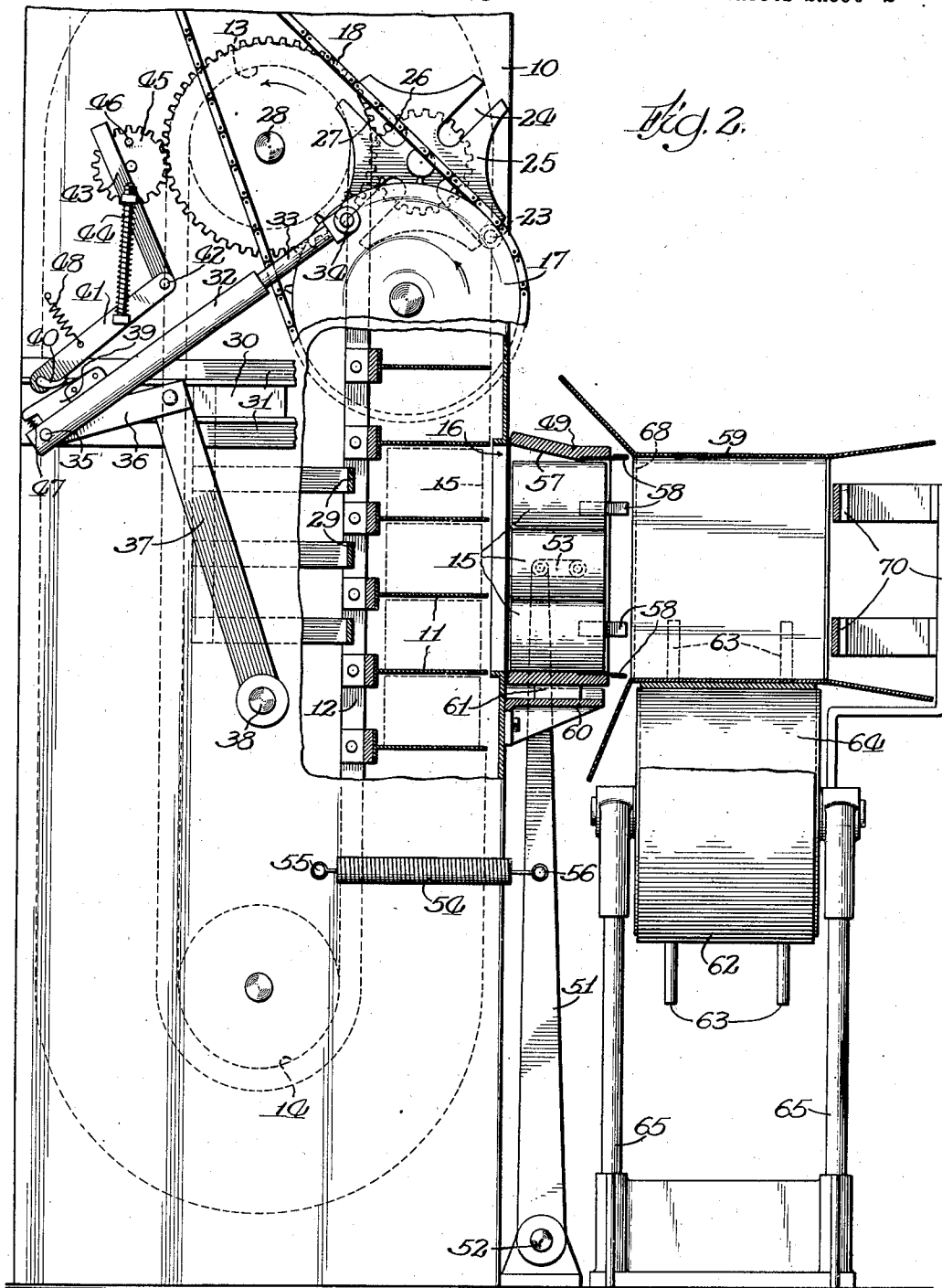
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PACKAGING MACHINE

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4 Sheets-Sheet 2



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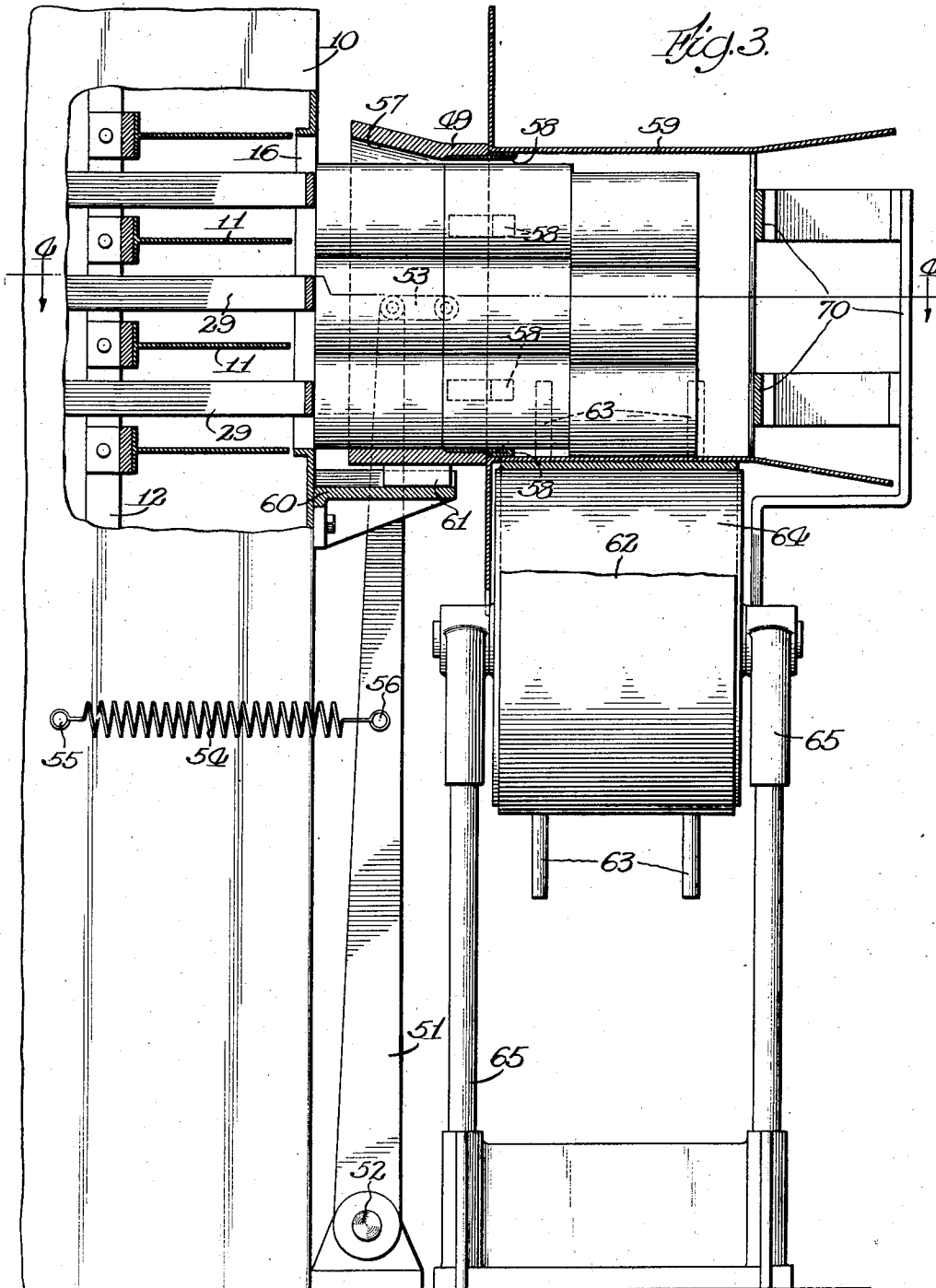
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PACKAGING MACHINE

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4 Sheets-Sheet 3



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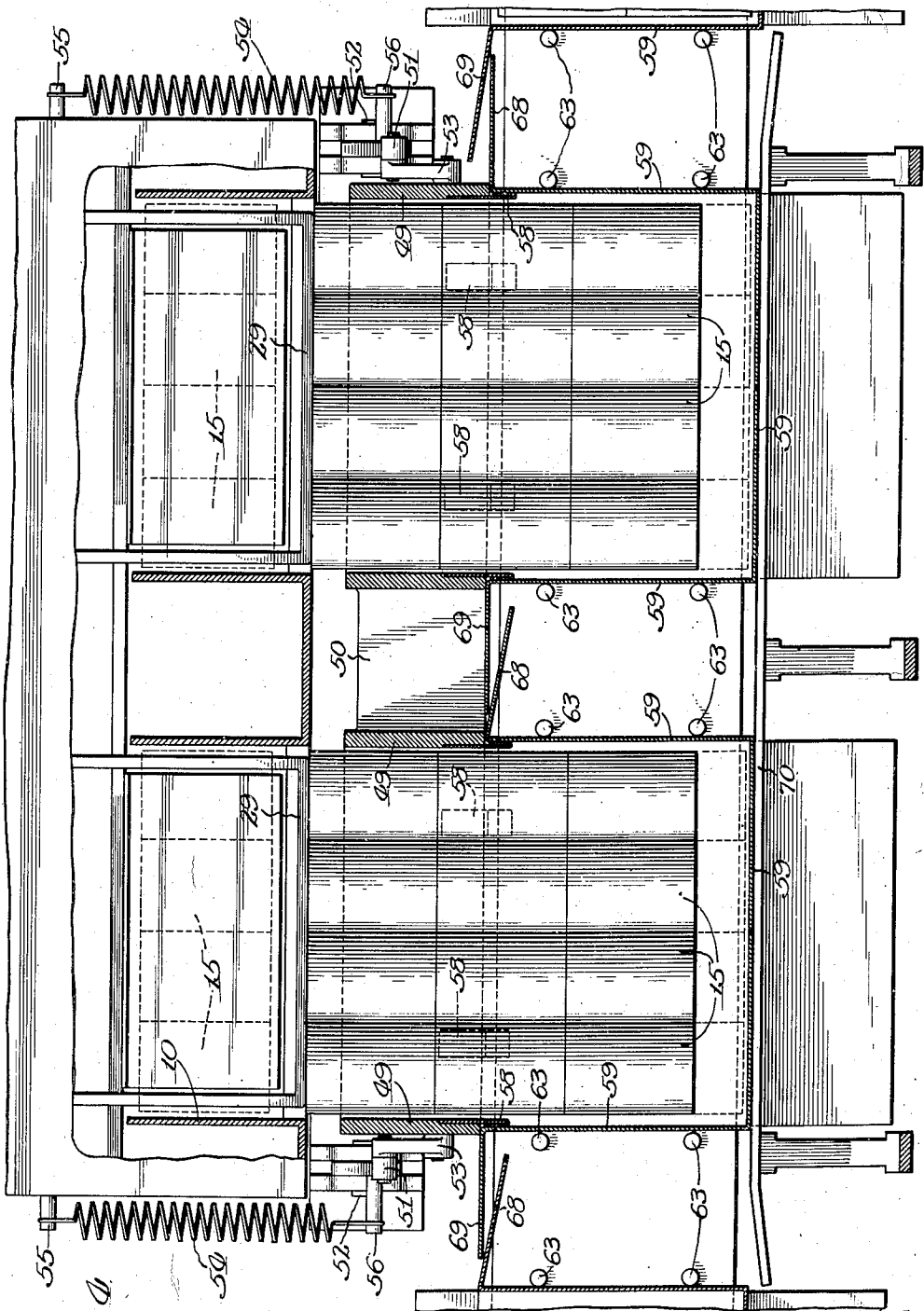
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PACKAGING MACHINE

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4 Sheets-Sheet 4



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UNITED STATES PATENT OFFICE

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PACKAGING MACHINE

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Application August 31, 1928, Serial No. 303,177

2 Claims. (Cl. 226—15)

This invention relates to machines for placing or packing containers, cartons and other objects into a case for shipment or storage purposes, and one of the objects of the invention is to provide an improved machine of this character in which the articles are conveyed to a delivery station to be delivered at such point into the case, the cases being also fed or delivered to the said station to receive a predetermined number of articles and then after being filled are conveyed away.

A further object is to provide an improved delivery spout adapted to be automatically positioned to project into the adjacent case for guiding and directing the articles into the case and then withdrawn so as not to interfere with the advancement of the cases.

To the attainment of these ends and the accomplishment of other new and useful objects as will appear, the invention consists in the features of novelty in substantially the construction, combination and arrangement of the several parts hereinafter more fully described and claimed and shown in the accompanying drawings illustrating this invention, and in which

Figure 1 is a front elevation of a machine of this character constructed in accordance with the principles of this invention.

Figure 2 is a view partly in elevation and partly in irregular section, as taken on line 2—2, Figure 1.

Figure 3 is an enlarged detail view of a portion of the machine and similar to the illustration shown in Figure 2.

Figure 4 is a detail horizontal sectional view taken on line 4—4, Figure 3, on an enlarged scale.

Referring more particularly to the drawings the numeral 10 designates a supporting structure within which is arranged a series of platforms or supports 11, the latter being connected with endless flexible members 12 which pass over sprocket wheels 13 and 14 arranged on horizontal axes.

The articles 15 are fed into the machine in any suitable manner and are received by the platforms or supports 11. During the operation of the flexible members 12 the articles are conveyed to a delivery station 16 to be delivered therethrough and into the cases. The platforms or supports 11 and the flexible members 12 are adapted to be intermittently advanced in any desired or suitable manner such as by means of a sprocket wheel 17 which is rotated by means of a sprocket chain 18 that receives its motion from a sprocket wheel 19 that is secured to a shaft 20. The shaft 20 is rotated preferably by means of a sprocket wheel 21 over which a sprocket chain 22 passes, and

this sprocket chain is itself driven from any suitable source of power, not shown.

The sprocket 17 has connected with it a projection 23 which is adapted to enter the openings 24 in a Geneva element 25, which latter is given an intermittent rotation as the sprocket 17 rotates.

Connected with the Geneva element 25 and for rotation therewith is a gear wheel 26, which meshes with a gear wheel 27 carried by the shaft 28, upon which the sprocket wheel 13 is mounted for rotation therewith so that when the gear 27 is rotated, the shaft 28 will also be rotated. Inasmuch as this gear 27 is intermittently rotated through the medium of the Geneva movement just described, it will be manifest that the endless flexible members 12 and the supports or platforms 11 will be given a corresponding intermittent movement.

The articles 15 are ejected from the platform or support 11 by means of a suitable ejector 29 which is mounted for reciprocating movement by means of a bar or rod to which slides 30 are connected. These slides operate in guides 31 and are adapted to be moved forwardly by means of a connection with the sprocket wheel 17. To that end there are provided telescoping members 32—33, one of which is pivotally connected as at 34 with the sprocket 17 and the other is pivotally connected as at 35 with a link 36 that in turn is connected with an arm 37, the latter being pivotally mounted as at 38. A latch 39 is provided for intermittently locking the elements 32 and 33 against relative movement, a cam 40 being connected with an arm 41 which in turn is pivotally supported as at 42, and an arm 43 is also mounted upon the pivot 42. A spring 44 is arranged between the arms 41 and 43 and tends normally to separate them, and a gear 45 meshes with the gear 27 and is provided with a projection 46.

At a predetermined time in the cycle of operation, the projection 46 engages the arm 43 and depresses it against the stress of the spring 44. The spring in turn will depress the arm 41 and cause the cam 40 to engage the catch 39 to depress it against the stress of the spring 47 and thereby lock the members 32 and 33 so that upon a rotation of the sprocket 17 the ejectors 29 will be moved forwardly to discharge the articles 15 from the supports or platforms 11. When the pin 46 passes out of engagement with the arm 43, the spring 44 together with a spring 48 will cause the cam 40 to move out of engagement with the catch 39 and the spring 47 will move the catch

39 to unlock the members 32 and 33 with respect to each other.

All of the above referred to parts form no part of the present invention but constitute a portion of the subject matter of my application, Serial Number 288,957, filed June 28, 1928, and are described in this application in order that the present invention may be clearly understood.

Arranged adjacent the delivery station 16 are tubular members or spouts 49, any number of which may be provided according to the capacity of the machine. In the present exemplification of the invention, however, two of such spouts are shown and are provided for the purpose of filling two cases simultaneously.

These spouts 49 are spaced laterally from each other for any desired distance in accordance with the sizes of the cases to be packed and the articles to be placed therein, and are connected together by means of a connecting member 50, the spouts being preferably mounted upon arms 51 which are pivotally mounted at 52 by their lower ends. To the upper ends of each of the arms is connected a link 53 and the links are in turn connected with the spouts or tubular members 49, thereby mounting these spouts for bodily swinging movement about the pivots 52.

Springs 54 are provided and anchored by one end as at 55 to a fixed support and by their other ends as at 56 to the arms 51 and tend normally to move the spouts 49 in a direction that they will stand in close proximity to the delivery outlet 16. If desired, the upper portion of the spouts may be enlarged as at 57 to assist in directing the articles thereinto. Connected with the spouts are spring fingers 58, any number of which may be provided and these fingers project into the case 59 so as to guide the articles 15 thereinto.

A support 60 may also be provided adjacent the delivery outlet 16 and connected with the lower portions of the tubular members 49 are projections 61 which ride upon the supports 60 for guiding the tubular members 49 and for assisting in supporting them.

The cases 59 are fed to the delivery station 16 in any suitable manner and to that end there may be provided an endless flexible conveyor 62 provided with flights 63, the conveyor passing over a pulley 64 rotatably mounted upon a suitable support 65 and also over a pulley 66 rotatably supported as at 67. Obviously the flexible member 62 may be formed of a sprocket chain if desired, and in that event the pulleys 64 and 66 will be in the form of sprocket wheels.

The cases are placed upon the conveyor 62 intermediate adjacent flights 63 and the adjacent flights 63 serve as a means for spacing the cases from each other. The cases are placed upon the endless conveyor to present an open side to the delivery station and the flaps are opened, the proximate flaps 68—69 of adjacent cases are folded outwardly at substantially right angles to the body of the cases, as shown more clearly in Figure 4, so as to overlap and not interfere with the filling of the cases. Certain of the flaps on the side of the cases opposite to the entrance side are folded down to form a partial closure for said side while the other flaps are maintained opened during the advancement of the cases and the filling thereof. The open flaps are then bent or folded down and secured. This obviates the necessity of having to open the flaps for sealing purposes after the cases are filled.

The cases thus positioned upon the conveyor are advanced until the open sides of the respective

cases are in alignment with the discharge ends of the respective tubular members 49 and at this point in their advancing movement the cases pass in front of a rack or member 70, which may be of any desired size and configuration and supported in any suitable manner to form an abutment for the outer portion or bottom of the case 59 and for holding the folded flaps on that side of the case in closed positions. This is necessary because when the articles 15 are ejected into the case some means must be provided for preventing folded flaps of the closed side of the case from being pushed open.

After the cases 59 have been positioned in front of the respective tubular members 49, the ejectors 29 will be operated to move the articles from the platforms or supports 11 into the tubular member 49, and one tier or row of articles 15 will be always held by the tubular member 49. Upon the next cycle of operation of the machine and upon the next operation of the ejectors 29 the supply of articles within the tubular member 49 will be ejected therefrom by the ejection of the articles 15 from the platforms or supports 11. This operation will be repeated until the cases 59 have been filled. The cases 59 will then be advanced and carried away from the machine. The extent of movement of the cases 59 is controlled by the operating mechanism for the conveyor, and in the present form of the invention, two cases will be advanced and positioned in front of the respective tubular members 49 at the same time, and upon each movement of the conveyor 62 which supplies the cases.

Any suitable means may be provided for actuating the conveyor, but a simple and efficient means embodies a gear 71 which is connected with the pulley 66 for rotation therewith. Meshing with the gear 71 is a gear 72 and connected with the gear 72 for rotation therewith is a Geneva element 73 with which a Geneva element 74 having an arm 75 is connected, and with which arm a projection 76 is connected. The Geneva element 74 has connected with it a sprocket wheel 77 over which a sprocket chain 78 passes and this sprocket chain in turn passes over a sprocket wheel 79 that is connected with a gear 80. The gear 80 in turn meshes with a gear 81 which is connected with the shaft 20. Thus, when the shaft 20 is rotated motion will be imparted to the intermeshing gears 80—81, which latter are preferably of the beveled type. This will impart rotation to the sprocket wheel 79 and will cause the sprocket chain 78 to rotate the sprocket wheel 77 and with it the Geneva element 74, arm 75 and projection 73. This will impart an intermittent step of rotation to the Geneva element 73, the latter in turn, through the medium of the intermeshing gears 72 and 71, will rotate the pulley 66 and thereby impart a corresponding advancing movement to the endless conveyor 62.

Thus it will be seen that the movement of the endless conveyor 62 during the cycle of operation of the machine will be controlled by the operation of the Geneva elements 73 and 74. These elements may be so arranged with respect to each other or so constructed that any desired extent of movement may be imparted to the conveyor 62.

It is thought that the operation of this machine will be clearly understood from the foregoing description, but briefly stated it is as follows.

The cases to be filled are placed upon the conveyor 62 and are advanced by intermittent steps of movement to positions in front of the tubular members 49. The articles to be placed within the

cases are conveyed to the discharge station 16 by means of the endless flexible members 12 and platforms or supports 11. When a predetermined number of articles have been positioned in front of the discharge outlet 16 and when the cases 59 have been positioned and their movement arrested, the ejectors 29 will be operated to move the articles from the platforms or supports into the tubular member 49. The next supply of articles which is presented to the discharge station by the platforms or supports 11 will be simultaneously ejected and during their ejecting movement the articles 15 which are disposed within the tubular member 49 will be ejected and during the ejecting movement of these last referred to articles the tubular members 49 will be advanced by reason of the fact that the arms 51 will swing about their pivots 52, causing the fingers 58 to enter the cases 59 to direct and guide the articles 15 into the case. The tubular member will then be withdrawn by reason of the action of the springs 54 and arms 51 so as to be in a position to receive the next supply of articles from the platforms or supports 11.

This operation will be continued until the cases 59 are filled, at which time the endless conveyor 62 will be advanced so as to position empty cases in front of the tubular members 49.

As the cartons are advanced into filling position in front of discharge outlet 16, the outermost of the overlapping flaps 68—69 is engaged by the ends of the tubular members 49 while still in their retracted position and folded into open position thereby also opening the inner flaps. The trailing flap of one carton hence serves to open the advancing flap of the following carton, and the advancing flaps which tend to project outwardly and forwardly are prevented from becoming jammed against the ends of members 49. The outward movement of tubular members 49 then further opens the overlapping flaps to the posi-

tion substantially as shown in Fig. 4. The rack or member 70 assists the ends of the tubular members 49 in thus folding flaps 68—69 since it maintains the cartons at a predetermined distance from the ends of members 49 as the cartons are moving toward and away from the delivery station or discharge outlet 16.

While the preferred form of the invention has been herein shown and described, it is to be understood that various changes may be made in the details of construction and in the combination and arrangement of the several parts, within the scope of the claims, without departing from the spirit of this invention.

What is claimed as new is:—

1. A packaging machine having a delivery station, means for conveying cases to said station to receive articles, said conveying means having case-holding devices so positioned with respect to each other and to the dimensions of the flaps of the case upon which the machine is designed to operate, that the flaps of the adjacent cases are in overlapping relation, and means operating as the case is advanced for folding into open position the outer of the overlapped flaps and thereby also opening the inner of the overlapped flaps.

2. A packaging machine having a delivery station, means for conveying cases to said station to receive articles, said conveying means having holding devices for said cases so positioned with respect to each other and to the dimensions of the flaps of the case upon which the machine is designed to operate that the adjacent closing flaps of adjacent cases are in overlapping relation, and means adjacent the path of movement of said cases adapted to engage the outermost of the overlapped flaps to maintain said flaps in open position while at the delivery station and while moving toward and away from said station.

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