March 11, 1958 C. Z. MONROE ET AL 2,826,411

MAGAZINE FOR FEEDING FLAT CARTON BLANKS

Original Filed March 30, 1948 6 Sheets-Sheet 1

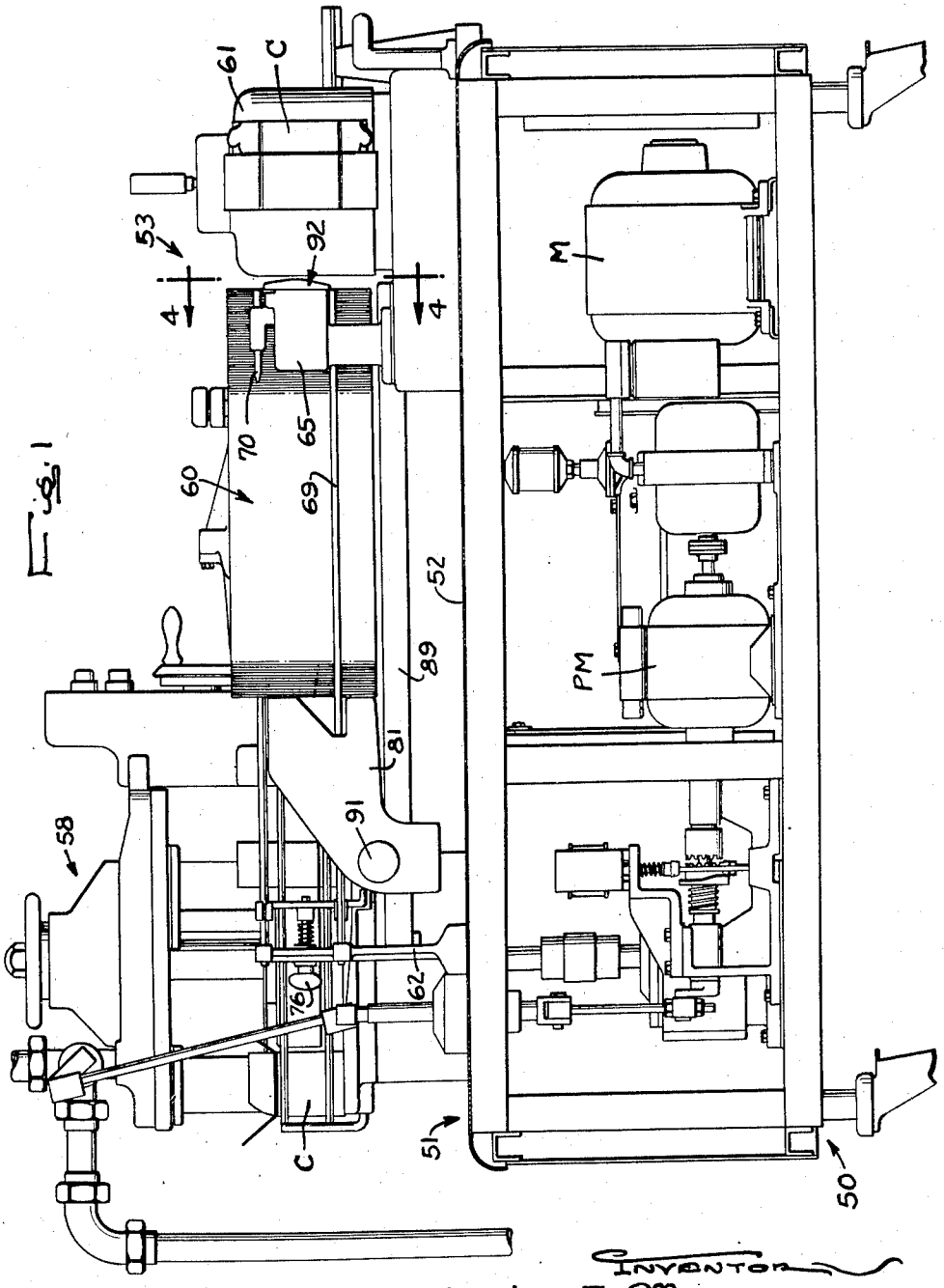


Fig. 1

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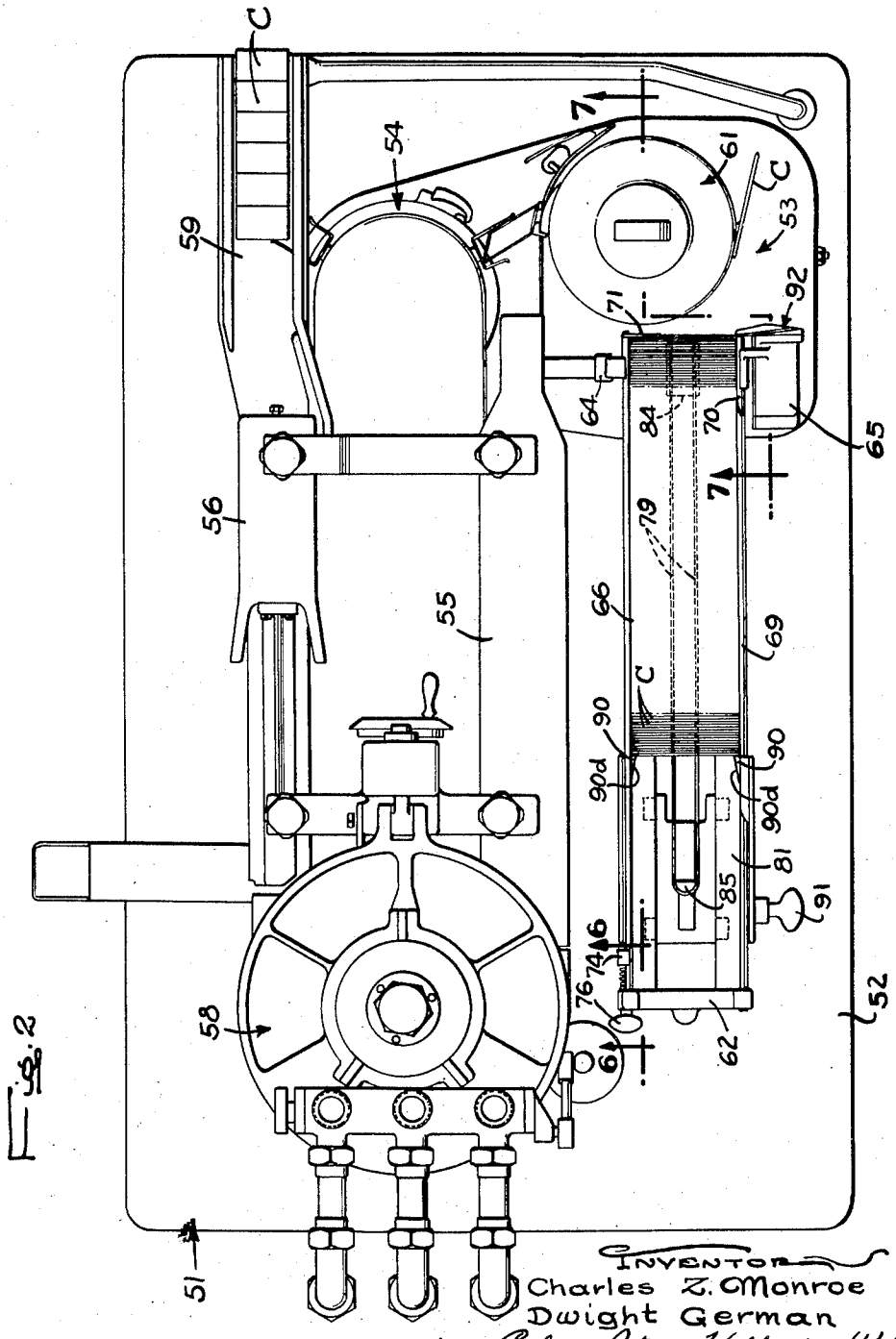


Fig. 2

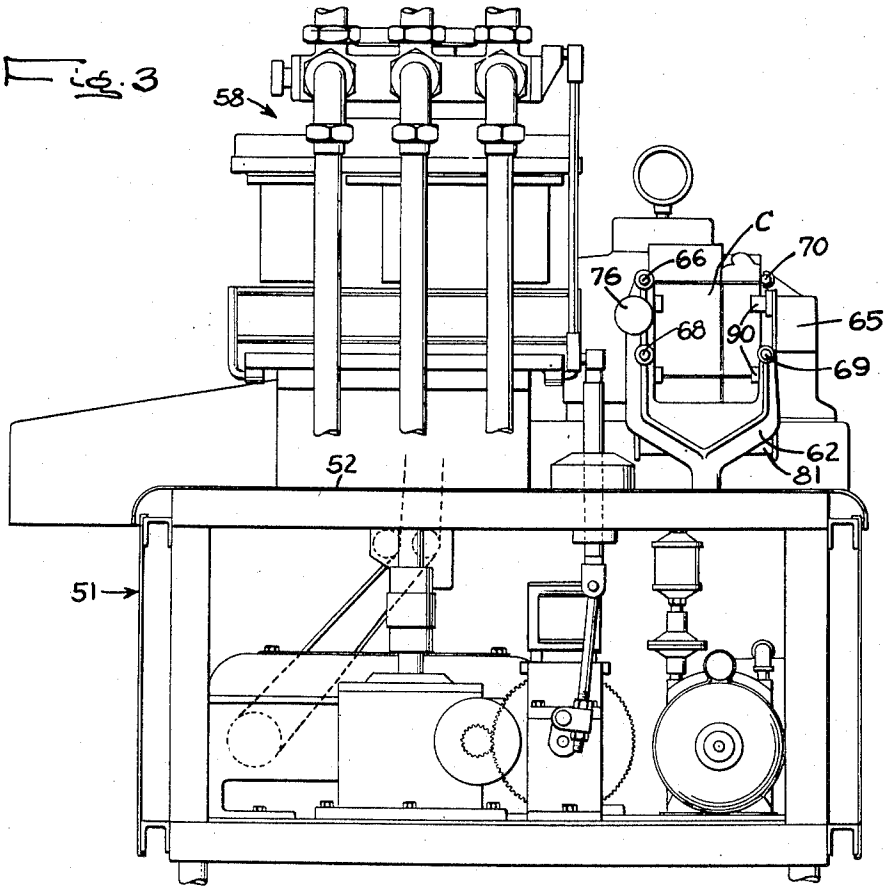
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Fig. 3



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Fig. 4

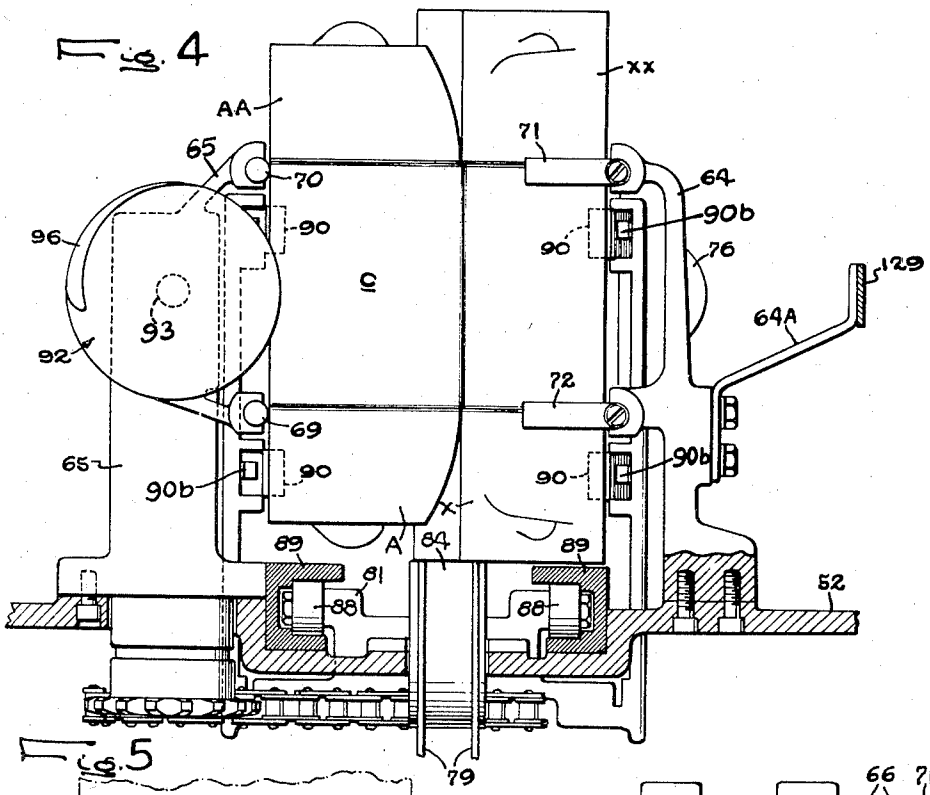
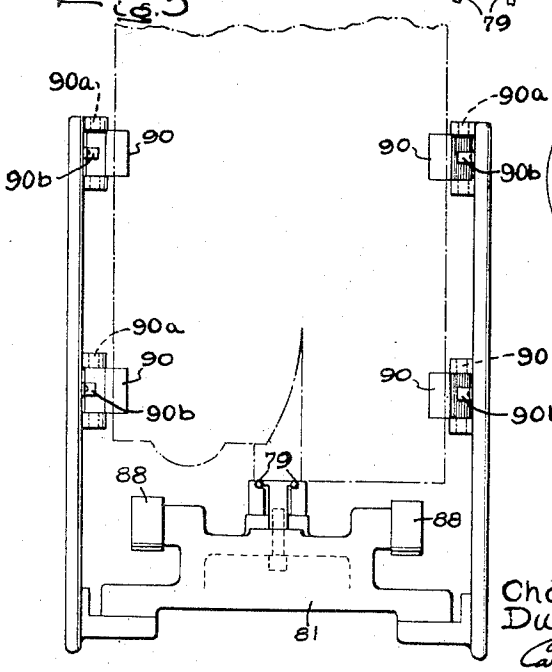


Fig. 5



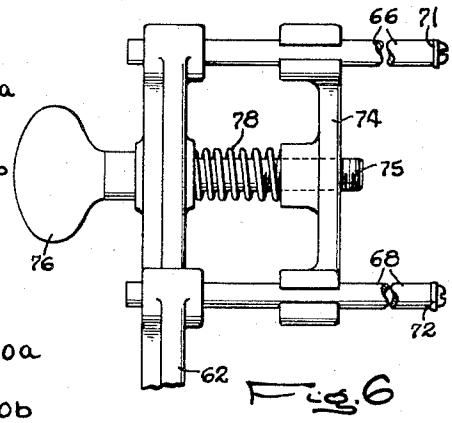


Fig. 6

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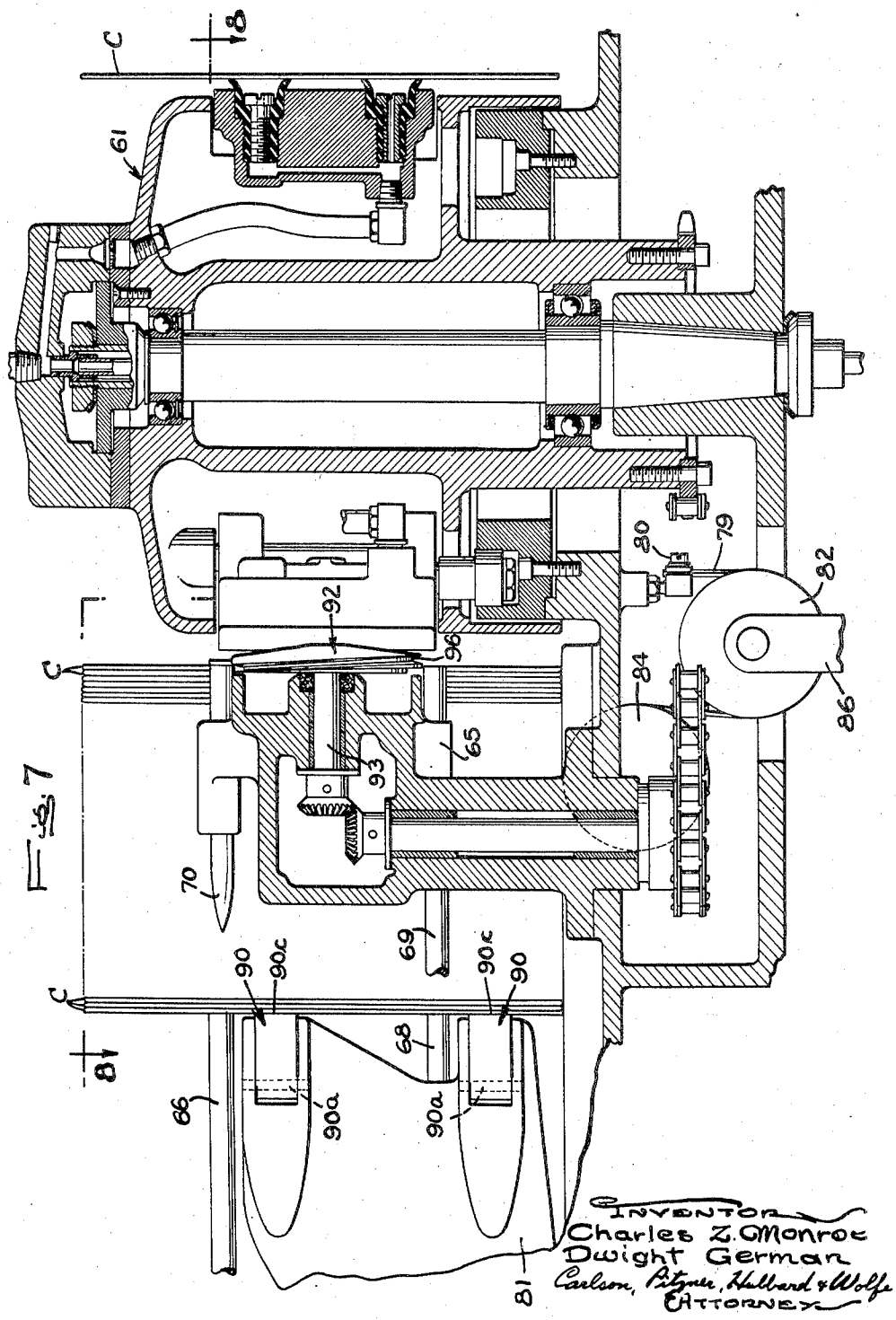


Fig. 7

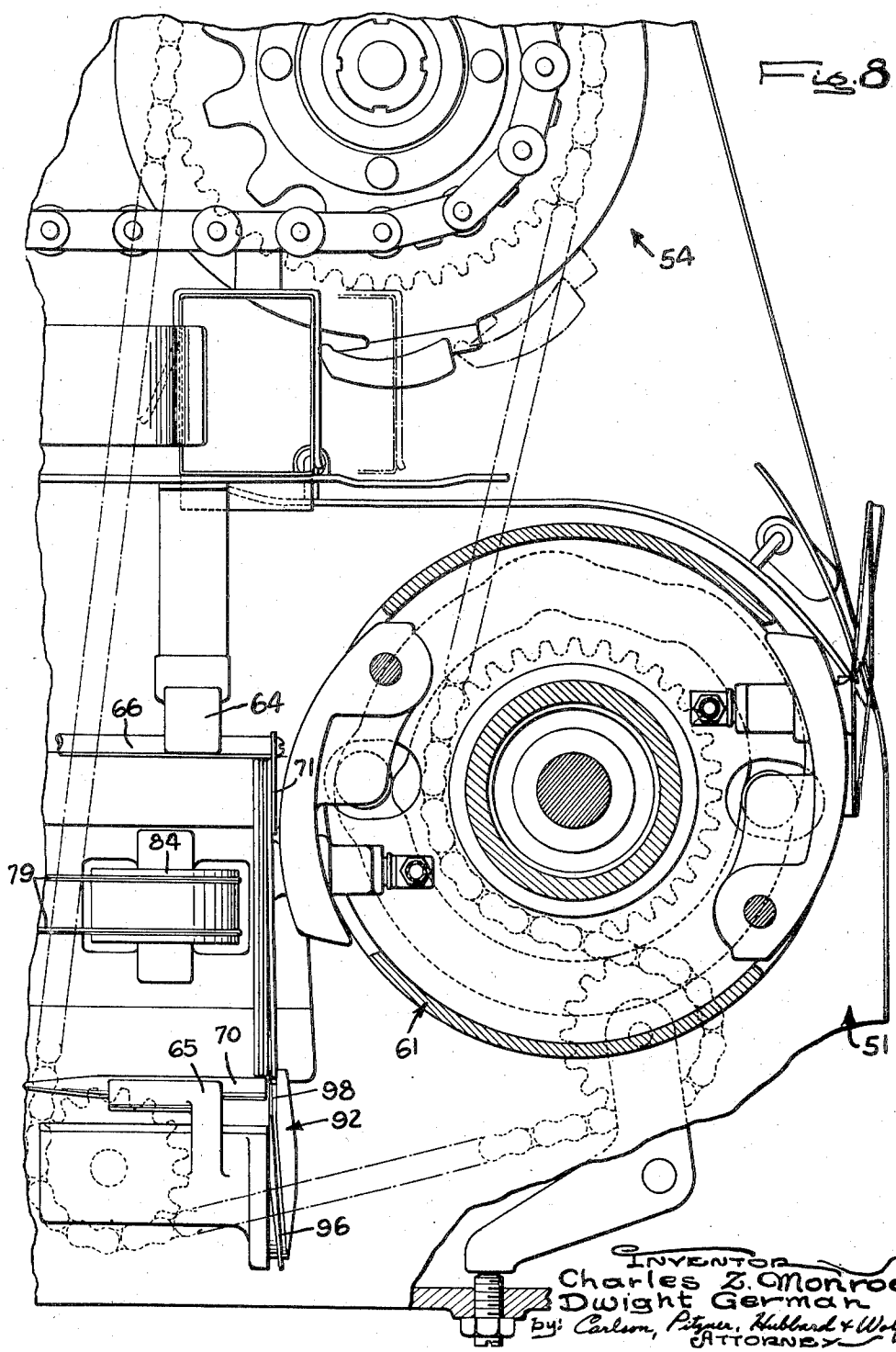
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Original Filed March 30, 1948 6 Sheets-Sheet 6

Fig. 8



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United States Patent Office 2,826,411 Patented Mar. 11, 1958

2,826,411

MAGAZINE FOR FEEDING FLAT CARTON BLANKS

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Original application March 30, 1948, Serial No. 18,034, now Patent No. 2,665,044, dated January 5, 1954. Divided and this application July 15, 1953, Serial No. 368,134

2 Claims. (Cl. 271—62)

The present invention relates to a magazine or feeder rack for holding a stack of flat carton blanks, and more particularly to a magazine adapted to be embodied in a machine for packaging fluent material, such as ice cream. This application is a division of our co-pending application Ser. No. 18,034 filed March 30, 1948 (now Patent No. 2,665,044) and entitled Machine for Packaging Fluent Material.

An object of the invention is to provide a magazine which is so arranged that additional cartons may be inserted into the magazine without disturbing the normal operation of the machine.

A further object is to provide a magazine having a carton pressing pusher element provided with movable carton engaging fingers adapted to be cammed out of the way when additional cartons are inserted into the magazine.

It is another object of the invention to provide a magazine having a movable element adapted to support the weight of the cartons in the magazine and to move forwardly along with the cartons as they are fed through the magazine.

Still another object of the invention is to provide a magazine having a movable carton compacting pusher element urged forwardly by a flexible tension element which also serves as a movable support for the stack of cartons in the magazine.

Further objects and advantages of the invention will become apparent in the course of the following description, taken in connection with the accompanying drawings, in which:

Figure 1 is a side elevation of a packaging machine which includes an exemplary feeder magazine constructed in accordance with the invention.

Fig. 2 is a plan view of the machine in Fig. 1.

Fig. 3 is an end elevation of the machine of Fig. 1, taken from the rear end of the magazine.

Fig. 4 is an enlarged fragmentary sectional view, taken generally in the plane of a line 4—4 in Fig. 1, and showing the front end of the magazine.

Fig. 5 is a front end view of a pusher carriage employed in the magazine, the carton stack being indicated in dot-dash outline.

Fig. 6 is an enlarged fragmentary side elevational view detailing an adjusting means associated with the feeder magazine, the view being taken from the plane of the line 6—6 in Fig. 2.

Fig. 7 is an enlarged broken vertical sectional view of the front end of the magazine and associated components, taken as indicated by a broken line 7—7 in Fig. 2.

Fig. 8 is an enlarged horizontal sectional view taken in the plane of a line 8—8 in Fig. 7.

While the invention is susceptible of various modifications and alternative constructions, a preferred embodiment has been shown in the drawings and will be herein described in some detail, but it is to be understood that there is no intention to limit the invention to the specific form disclosed, the intention being, on the contrary, to

cover all equivalents, modifications and alternative constructions falling within the spirit and scope of the invention as expressed in the appended claims.

Referring more specifically to the drawings, the invention is there exemplified in a magazine or feeder rack **60** illustrated in connection with a packaging machine **50** adapted in this instance to receive ice cream in semi-fluent form from a continuous freezer and to pack the same into paper cartons for retail distribution. The machine **50** is organized upon a caster-supported frame structure or table **51** having an enclosure which houses a main drive motor M and a pump driving motor PM, together with associated power transmitting mechanisms. The magazine **60** forms a part of a carton feeding and transfer mechanism **53** which is adapted to present folded or knocked-down carton blanks C to a conveyor **54**, the blanks being erected into open-ended tubular form as an incident to such transfer. Included in the mechanism **53** is a peeler wheel **92** adapted to release the cartons, one by one, from the magazine **60**, and a transfer turret **61** for transferring the released cartons from the magazine to the conveyor **54**. To support the mechanism **53**, the table **51** is provided with a top **52**.

Operatively associated with the conveyor **54** and also mounted on the table top **52** are carton flap closing devices **55** and **56**, together with a carton filler head assembly **58**. All of the carton handling devices just mentioned are driven in timed relation from the motor M through suitable gearing. With the foregoing arrangement, each erected carton blank is moved into engagement with bottom flap closure means including a latching device **55**, thence passing under the filler head assembly **58** where it receives a measured quantity of ice cream. The filled carton is thereupon moved into engagement with the top flap closure means including a second latching device **56** from which it is transferred to a discharge chute **59**. In actual operation, the machine **50** fills cartons with remarkable speed and discharges them in a constant procession at a rate which is proportional to the discharge rate of the continuous freezer with which the machine is associated.

The present invention is not concerned particularly with details of the conveyor **54**, the peeler wheel **92**, the transfer turret **61**, the carton flap closing devices **55** and **56** or the filler head assembly **58**, and hence these components of the packaging machine **50** will not be described in detail in this application. For a complete disclosure of the packaging machine **50**, reference may be had to our original parent application Ser. No. 18,034, filed March 30, 1948 (now Patent No. 2,665,044). In this original application, the filler head assembly is claimed as a distinct invention. The arrangement of the peeler wheel and the transfer turret is claimed as a distinct invention in our co-pending application Ser. No. 255,074 filed November 6, 1951 (now Patent No. 2,747,473), as a division of our original application Ser. No. 18,034, and entitled Feeding and Erecting Mechanism for Carton Blanks. Reference may also be had to our co-pending application Ser. No. 368,136 filed July 15, 1953, now Patent No. 2,780,900, and entitled Closure Flap Manipulating Mechanism for Carton Filling Machine, in which certain of the means for manipulating the closure flaps are claimed as a distinct invention.

It will be noted upon reference to Figs. 1, 2 and 4 that the magazine or feeder rack **60** comprises an upstanding yoke-shaped bracket **62** supported upon the table top **52** in spaced apart relationship with a pair of brackets **64**, **65** also fixed to the table top. Spanning the brackets **62** and **64**, and relatively slidable with respect thereto, are two vertically spaced guide rods **66**, **68**. Spanning the brackets **62** and **65**, but rigidly fixed thereto, is another guide rod **69**. In addition to the latter, the bracket

65 also carries a relatively short guide rod 70 disposed in vertically spaced relationship with the rod 69. The cartons C are rectangular in cross section when erected, but initially are folded flat or collapsed and are adapted to be stacked horizontally in the magazine 60 with their folded vertical edges held in close alinement by the rods 66, 68, 69 and 70, so as to facilitate the removal of the cartons from the magazine.

Each of the cartons C is provided with four lower closure flaps A, B, X and Y, together with an identical set of upper closure flaps AA, BB, XX and YY.

For the purpose of positioning the foremost carton blank C in the magazine 60, the guide rods 66 and 68 are provided with a pair of stop lugs 71, 72 (Figs. 4 and 6) screwed or otherwise rigidly fastened to the ends of the rods adjacent the transfer turret 61. In order to render the carton stack adjustable relative to the turret 61, the position of the stop lugs 71 and 72 with respect to the brackets 62 and 64 can be altered by means of an adjusting bracket 74 which is pinned or otherwise secured to the rods 66 and 68. The bracket 74, in turn, can be positioned relative to the bracket 62 by means of a suitably threaded adjusting stud 75 having a hand knob 76 unitary therewith. Any lost motion between the stud 75 and the bracket 74 is taken up by means of a coil compression spring 78 interposed between the brackets 62 and 74.

Provision is made for supporting the weight of the carton blanks C stacked in the magazine 60 upon a member which has no motion relative to the blanks as the latter are fed along the magazine. This is accomplished in the present instance by the use of a flexible tension element in the form of a cable 79 anchored to the table top 51 as at 80 (Fig. 7) and running longitudinally under the magazine 60 to a reciprocable pusher carriage 81. As shown in the drawings, the magazine 60 is open at the bottom, and the cable 79 forms the "floor" thereof to support the carton blanks. As indicated in the drawings, the cable 79 is arranged as an elongated loop running downwardly from the anchorage 80 around a floating pulley 82 and thence upwardly to a guide pulley 84 and finally horizontally to a semi-circular anchor post 85 mounted on the pusher carriage 81, the cable being looped around the post. To obtain sufficient tension in the cable 79 to offset the weight of the cartons in the magazine, and to urge the pusher carriage 81 against the rear end of the carton stack, a relatively heavy weight (not shown) is suspended from the floating pulley 82 by means of a yoke 86 (Fig. 7). In this instance, the lower edges of the closure flaps B and X rest upon the cable 79. As the carton blanks are individually removed from the front of the stack, the pusher carriage 81 advances under the biasing influence of the weight on the pulley 82, the cable 79 moving with the carton stack so that there is no frictional sliding between the two.

The pusher carriage 81, which is adapted to maintain the stack of carton blanks in compression against the stop lugs 71, 72 and the peeler wheel 92, comprises a generally U-shaped member equipped with supporting rollers 88 adapted to run in a pair of spaced apart parallel guide rails 89 (Figs. 4 and 5). The tension in the cable 79 urges the pusher carriage 81 toward the transfer turret 61 and, as the blanks are fed from the magazine 60, such tension maintains the carriage in constant abutment with the lattermost carton blank in the stack.

Provision is made for adding to the supply of carton blanks in the magazine 60 without disturbing the operation of the machine in any way. This is achieved in the present instance by equipping the carriage 81 with a plurality of pusher fingers 90 mounted on pivots 90*a*. These fingers 90 are normally urged inwardly of the carriage by means of suitable biasing springs 90*b*, but the fingers are movable outwardly to a position clear of the stack of cartons C. Formed on each finger 90 is a forwardly facing abutment surface 90*c* which is engageable with the rear end of the stack. To provide for insertion of additional cartons, each finger 90 is formed with a rearwardly facing, outwardly and rearwardly slanting cam surface 90*d*. Thus, if it be desired to add carton blanks to the stack in the magazine, it is only necessary for the operator to place the additional blanks inside the pusher carriage 81 and to push them forwardly against the rearmost blank in the magazine. This will cam the fingers 90 outwardly. While holding the additional blanks in place, the operator may grasp a handle 91 and move the carriage 81 rearwardly. The cam surfaces 90*d* on the fingers 90 will slide along the edges of the additional blanks, and, after passing the rearmost of the additional blanks, will spring inwardly for abutting engagement with the rearmost blank.

At a point opposite from the stop lugs 71 and 72, the vertical side edge of the foremost carton blank C in the stack bears against one face of the peeler wheel 92 (Figs. 2, 4, 7 and 8) which is adapted to effect a positive separation between the foremost carton blank and the remaining blanks in the magazine 60. The peeler wheel 92 is carried on a drive shaft 93 journaled in the brackets 65 for rotation on an axis substantially parallel to that of the magazine 60. Mounted on the peeler wheel 92 is a knife plate 98 adapted to wedge between the foremost carton blank C and the remainder of the stack, as the wheel 92 is rotated. After thus being separated by the knife 98, the foremost carton is moved forwardly by means of a deep single helical thread 96 which cuts completely across the outer periphery of the wheel 92. The transfer turret 61 then slides the separated carton laterally edgewise out from under the stop lugs 71 and 72, and carries the carton to the conveyor 54. Further details of the transfer turret 61 and the peeler wheel 92 are disclosed and claimed in our copending application Ser. No. 255,074 filed November 6, 1951 (now Patent No. 2,747,473).

We claim as our invention:

1. In a magazine for feeding flat carton blanks, the combination comprising lateral guide members open at the bottom for receiving a stack of the carton blanks and alining the edges vertically thereof, an open pusher carriage movable longitudinally of the guide members and having spaced vertical arms embracing the blank stack, movable fingers on said arms biased inwardly and having forwardly facing abutment surfaces for engaging the rearmost carton in the stack, a flexible tension member connected to said pusher carriage and extending forwardly therefrom between said guide members to form a movable floor therebetween, a pulley mounted adjacent the front end of the magazine, said tension member being trained downwardly over said pulley, means for applying tension to the front end of said tension member so that the latter exerts a biasing force on said carriage causing said fingers to urge the blank stack in a forward direction and supports the weight of the carton blanks in said magazine without moving relative to the blanks as they are fed forwardly, said fingers having rearwardly facing cam surfaces slanting outwardly and forwardly so as to be cammed outwardly by relative forward movement of additional carton blanks through said carriage, and means for manually retracting said carriage so that said fingers cam past additional carton blanks placed rearwardly of said carriage in said magazine and then snap inwardly for engagement with the rearmost of the additional blanks.

2. In a magazine for feeding flat carton blanks, the combination comprising spaced lateral guiding means open at the bottom for receiving a stack of the carton blanks and alining the lateral edges thereof, an open yoke-shaped pusher carriage movable longitudinally of said guiding means and having vertical arms disposed outside said guiding means to permit the insertion of additional carton blanks forwardly through the carriage,

a plurality of fingers pivoted on said arms and biased inwardly for engagement with the rearmost blank in the stack, a pair of laterally spaced cable elements connected to said pusher carriage and extending forwardly therefrom between and beneath said lateral guiding means to form a movable floor for supporting the carton stack, a pulley adjacent the forward end of said magazine for training said cable elements downwardly, and a weight connected to the front ends of said cable elements for tensioning said cable elements so as to urge said pusher carriage fingers forwardly against the rear end of the stack, and support the carton blanks without movement relative thereto as the pusher carriage advances during feeding, each of said fingers having a rearwardly facing cam surface for deflection of the same outwardly as blanks are moved relatively forwardly through said carriage, whereby additional cartons may be placed in the magazine rearwardly of said carriage and the latter retracted against the bias of said weight, the fingers being deflected and then snapping into engagement with the rearmost of the additional blanks.

References Cited in the file of this patent

UNITED STATES PATENTS

1,219,426	Beckman	Mar. 20, 1917
1,428,149	De Minico	Sept. 5, 1922
1,530,985	Crissman	Mar. 24, 1925
1,592,796	Webster	July 13, 1926
1,636,014	Robinson	July 19, 1927
2,119,585	Knowlton	June 7, 1938
2,220,073	Belcher	Nov. 5, 1940