

Dec. 23, 1952

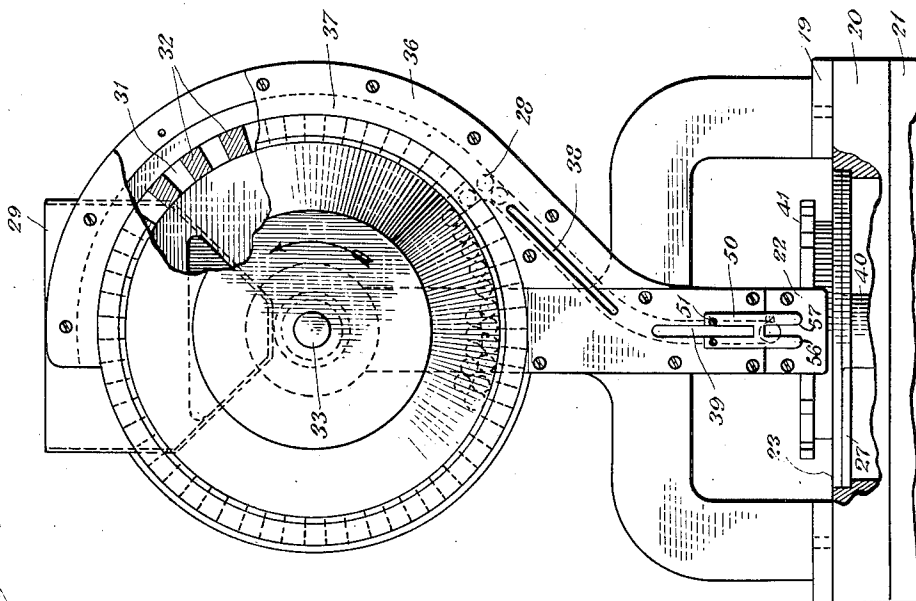
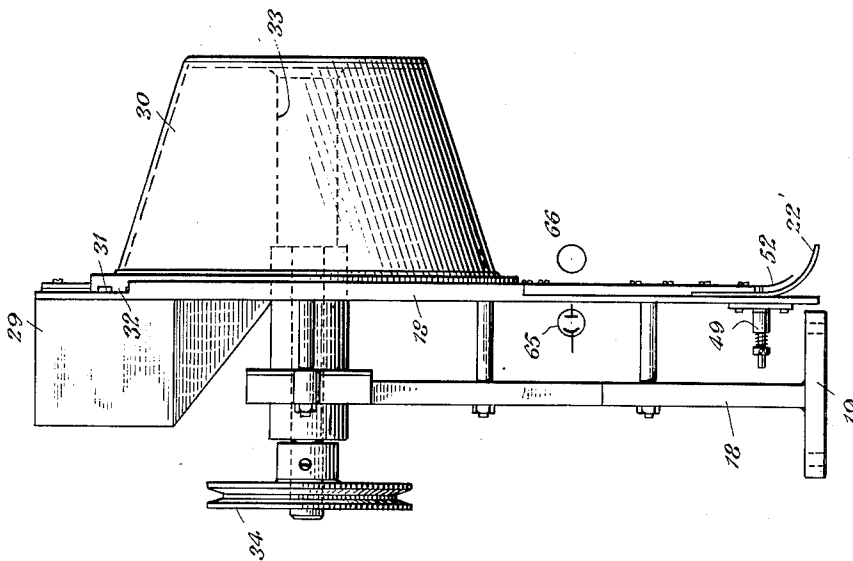
F. MENDEZ ET AL

2,622,459

BLANK SEPARATOR AND FEEDING APPARATUS

Filed June 14, 1950

2 SHEETS--SHEET 1



INVENTORS
FRANCISCO MENDEZ
RAFAEL O. ALMODOVAR
BY

BY
Ernest Varney, Whittemore and Dix

ATTORNEYS

Dec. 23, 1952

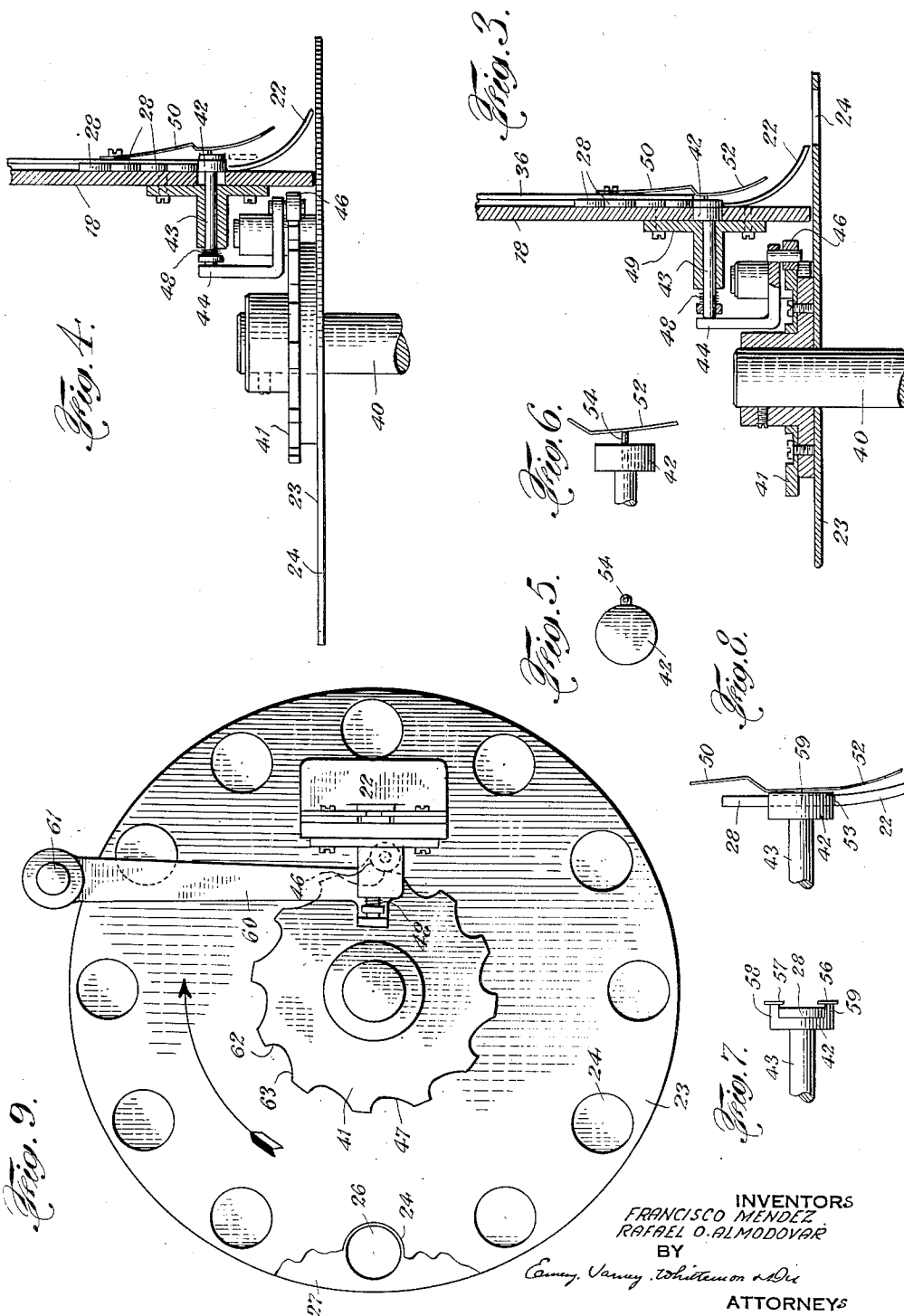
F. MENDEZ ET AL

2,622,459

BLANK SEPARATOR AND FEEDING APPARATUS

Filed June 14, 1950

2 SHEETS—SHEET 2



UNITED STATES PATENT OFFICE

2,622,459

BLANK SEPARATOR AND FEEDING
APPARATUS

Francisco Mendez and Rafael O. Almodovar,
Santurce, P. R., assignors to Red Star Mfg. Co.
Inc., Santurce, P. R., a corporation of the ter-
ritory of Puerto Rico

Application June 14, 1950, Serial No. 168,092

11 Claims. (Cl. 79—17)

1

This invention relates to a new and improved apparatus which functions to feed blanks in desired and proper order to a portion of a machine that performs certain operations on the blanks.

More in particular, the invention pertains to a novel apparatus for receiving button blanks in quantity and for distributing them singly to a particular part of a machine that shapes and drills the button blanks.

One of the features of the improved invention is to provide a novel apparatus that will properly handle, automatically and with minimum breakage and loss, button blanks of shell construction that in many cases are fragile.

Another feature of this invention is to provide a simple apparatus that will hold a large number of somewhat fragile button blanks and separate them out and feed them one by one to a definite point in a machine where they will be carried to a definite position for the first of a series of machine operations.

Heretofore no satisfactory way of feeding these somewhat fragile blanks to the operating machine had been provided except by hand. This requires the employment of a single person for each operating machine.

With the improved apparatus herein, a quantity of the blanks may now be fed into a hopper, and they pass to a bin or container and are then automatically and delicately handled and separated into a channel in tandem fashion and thereafter released therefrom in regulation order and in predetermined synchronism with the operation of the main machine.

More than a majority of buttons now provided for dresses, shirts, clothing, and for other uses, is produced from shell material such as by cutting blanks from oyster, clam, and other types of shells, and then recutting, shaping, and drilling the blanks to provide the particular shapes that will fulfill the particular purposes desired of the buttons.

In view of other materials, such as plastics, coming into the button trade, it is desirable to produce the best shape and best looking button at as small a cost as possible. With the improved apparatus herein, it is possible to save considerable labor at the operating machines. By adding this improved apparatus onto the button forming machine, it is possible to use one operator-attendant to approximately every six or seven machines, where heretofore one person was required for each machine.

Another feature of this invention is to provide an improved structure of apparatus that includes

2

a moving part that adapts itself to receiving one of the many blanks from the many blanks in the bin and then to deliver the separated blank automatically to a feed channel that guides the blank to an opening in a synchronized working part of the main machine. The improved apparatus also includes a special means for freeing each blank in succession in a definite synchronism and sequence into one of the working parts of the operating or forming or main machine.

A further feature of the improved invention is the incorporation of a novel structure in the apparatus that definitely and positively maintains and then delivers each blank from the feed apparatus.

Another feature of the novel invention is to provide a portion of the button feed structure that cooperates with the buttons to maintain the machine in operation, but acts to stop the main machine when the supply of button blanks has become exhausted.

Other features and advantages of the invention will be appreciated on reading the description below, when taken in connection with the drawings, wherein

Fig. 1 is a side view of the improved blank feeding apparatus;

Fig. 2 is a front view of the apparatus of Fig. 1 with a part broken away showing a portion of a rotor in section;

Fig. 3 is a view partially in section of the lower part of the feed apparatus showing a plunger in withdrawn position and operable by a shaft connected to a main operating machine;

Fig. 4 is a view corresponding generally to Fig. 3, and shows the plunger in extended position;

Figs. 5 and 6 are front and side views, respectively, of the front of the plunger, and its cooperation with a spring;

Figs. 7 and 8 illustrate a modified form of plunger and its cooperation with a spring; and

Fig. 9 is a top plan view of a part of the main operating machine illustrating a perforated plate for receiving the button blanks and shows a cam structure for operating the plunger.

Referring now to the drawings, a simple, efficient button blank feed apparatus or structure is illustrated as being provided with a support or frame 18 and having a foot portion 19 that engages a frame 20 of a main operating machine 21 in a position to have button blanks delivered onto guide 22 and from there to a plate 23 provided with perforations 24, so that the button blanks are delivered from guide 22 to openings

3

24 and are carried around until they drop into an opening 26 formed in a second plate 27 carried by or rigidly mounted on the frame 20 of the main machine 21. The button blanks after being received in the main machine at opening 26, are thereafter recut, formed, and drilled.

The button blanks 28 are delivered in quantity to a hopper 29 and they pass to a bin or container 30 where they become automatically and individually separated with minimum breakage or chipping by passing into openings 31 formed between teeth 32 which are usually and for this preferred form of apparatus, formed in the left hand end of the bin 30. The bin 30 is preferably mounted on shaft 33 which is driven through a suitable pulley 34 thereby rotating the bin, and allowing the blanks to drop into the openings 31, Fig. 2. In mounting the bin, the faces of the teeth 32 are positioned in very close proximity to or slightly engage a plate or support 18, and thus form a substantially closed bin.

Referring particularly to Figs. 1 and 2, the feed apparatus is provided with a cover 35 fitted to support 18 and within which a channel 37 is formed. In the preferred construction, the cover 36 properly covers the channel 37 and assists in guiding the blanks downwardly to a point just above the guide 22. The cover 36 is provided with suitable openings 38 and 39 which allow for the observation of the movement of the blanks, and if for any reason, the blanks become caught or stuck, an instrument may be inserted in these openings 38 and 39 to move the blanks along. It will be noted from Fig. 2 that the blanks in the openings 31 will drop out into channel 37 as the bin or container 30 revolves in the direction of the arrow. The blanks will then carry down through to a position at the bottom end of the opening 39. The storage bin or container may be driven at any desired speed so long as it operates to keep the channel 37 supplied with blanks in tandem positions. The shape of the container will also be noted. With this truncated form the last blank in the bin will be delivered into channel 37.

In the operation of this improved blank feeding device, it is desirable to feed each blank to plate 23 and into opening 24 at definite time intervals which are synchronized with the functioning of the main machine that performs the recutting, drilling, forming and any other operation. Any suitable apparatus for cooperating with part of the drive of the main machine and for releasing the blanks in synchronism to the main machine may be provided.

In the preferred apparatus herein and referring particularly to Figs. 3 and 4, there is illustrated a shaft 40 which is driven by machine 21 and which extends up through plate 23 and has mounted thereon a cam 41 which in turn functions to move a plunger 42 in synchronism with the operations of the main machine. The operation of plunger 42 provides for the freeing of each blank 23 from its support in proper sequence, and allows it to pass down guide 22 into opening 24. The plunger 42 is preferably carried on the end of shaft 43 which engages an arm 44 that is moved back and forth by reason of roller 45 engaging the depressions 47 in cam 41. A suitable spring 48 functions to retract the plunger 42 into a formed opening in frame 18 provided for the plunger. A suitable plate-bearing 49 is affixed to support 18 for carrying plunger 42 and its shaft.

Any desirable means may be employed for holding the blanks 28 in position in front of plunger 42, and usually the top end 53 of guide 22 forms a

4

support on to which the blanks 28 drop as they reach the end of channel 37. A desired assisting means for holding the blanks on the top of guide 22 is here incorporated in the form of a relatively weak spring 50 mounted in desired position by screws 51 and is shaped to have a lower outwardly extending portion 52. This spring is so mounted that in many instances it does not definitely engage each blank as the blank reaches a position in front of the plunger 42, but the spring is sufficiently close to the blank so that it prevents the blank from tipping off its seat 53 at the top of guide 22.

As the machine operates, the plunger 42 functions to push the blank in front of it off from seat 53 and allows the blank to slide down the face of guide 22 into one of the openings 24 in plate 23. It is desired not to pinch the blank as it is moved off from its seat 53 by having the spring 50 engage one face of the blank and the plunger 42 engage the other face. One form of structure for eliminating such pinching is the provision of a pin 54 carried by the side of plunger 42 as illustrated in Figs. 5 and 6. This pin pushes the lower end 52 of spring 50 forward so that the blank is not pinched and is allowed to fall down onto the guide 22.

In the preferred structure of spring 50 illustrated in the various figures and for purposes of making it of light weight and, therefore, very flexible under small pressures, the spring is provided with two legs 56 and 57. It will be understood that the spring 50 may be replaced by a flexible guard mounted to keep the lowermost blank from falling from its support and adapted to be moved by the extensions carried by the punch or plunger. Other suitable means for preventing the lowermost blank from falling from its support may be provided so long as it functions and may be moved so as not to pinch the blank as it is pushed from its support.

A modified form of structure for suitably receiving the blanks and for moving the spring, is illustrated in Figs. 7 and 8, wherein the plunger 42 is made U-shape with extensions 58 and 59 that engage the legs 56 and 57, respectively, of the spring 50. It will be noted in referred to Figs. 7 and 8 that the blank 28 falls within the U-structure of the plunger 42 and engages seat 53. The distances between the spring legs 56 and 57 and the bottom of the U of plunger 42, is usually greater than the thickness of the blank, thereby providing some clearance.

As the plunger 42 is moved forward by reason of the operation of cam 41, it will be noted that the spring will also be pushed outwardly thereby eliminating any pinching and allowing the blank to drop down on to guide 22 and thereby move to opening 24 in plate 23. The illustrated structures in Figs. 7 and 8 also show that extensions 58 and 59 act to properly guide and hold the blanks sidewise as they drop into position upon the return of the plunger to its normal inward position.

In the preferred structure, the arm 44 which carries the roller 46 in engagement with cam 41 may be supported in any suitable manner as by an arm 60 pivoted at 61, as illustrated in Fig. 9. Also, it may be noted that the cam surfaces 47 of cam 41 may be formed to give any desired cam action or a uniform operation of the plunger, but it is desired that those surfaces be modified by having a sharp slope 62 for returning the plunger quickly and a relatively gradual slope 63

5

to move the plunger to its normal outward position.

In the operation of several of the machines under the eye of one operating-attendant, it is desired to have a suitable safety means to require the machines to automatically shut down when there are no more blanks to be operated on. For this purpose and as illustrating one form, a photoelectric cell, composed of its two elements 65 and 66, which operate through a hole in support 18 and through opening 39, may be employed. Any other type of safety means for shutting down each machine may be employed.

It will be seen that the improved blank feed apparatus is not complicated and that it performs a simple function and that it efficiently handles somewhat fragile blanks and is of large enough structure to receive a large number of blanks and to separate them into a channel where the blanks move in tandem so that they may be passed without injury to their structures to a main operating machine in synchronism with the driving mechanism of that machine so that the blanks may be properly recut, shaped, and drilled. Also, it will be noted that a very simple structure is employed for releasing the blanks from the feeding apparatus at definite times, and also provides guides for those blanks so that they will not fall out of the machine.

It will be understood that various modifications and changes may be made in the preferred form of the invention herein, and such modifications and changes are to be understood as part of this invention, as outlined in the following claims.

The invention claimed is:

1. In an apparatus for singly dispersing somewhat fragile button blanks, the combination of a bin for receiving a plurality of said blanks, a movable means for receiving and separating single blanks from said supply, said movable means having a series of slots therein for receiving separate blanks, a channel mounted adjacent said movable means for receiving said blanks in tandem from said movable means, a support at the lower end of said channel for receiving said blanks separately edgewise, and a plunger for engaging the faces of the blanks on said support and pushing them facewise from said support.

2. In an apparatus for singly dispersing somewhat fragile button blanks, the combination of a bin for receiving a plurality of said blanks, a movable means for receiving and separating single blanks from said supply, said movable means having a series of slots therein for receiving separate blanks, said movable means also acting as a bin for said blanks, a frame for supporting said bin, means for rotating said bin, a channel in part of said frame for receiving said blanks from said bin in succession, a cover for said channel, a support at the end of said channel for holding each blank edgewise as it reaches the bottom of said channel, a plunger mounted for reciprocating endwise movement through said channel above said support and located in position to engage the face of the blank on said support while advancing and to eject it facewise from said channel, means for holding each blank from falling facewise off said support while the plunger is being retracted, and means for rendering said holding means inoperative during the advancing stroke of the plunger to permit ejection of the blank from said support.

3. In an apparatus for singly dispersing some-

6

what fragile button blanks, a frame, a bin carried on said frame and positioned to receive a quantity of said blanks, said bin having alternate teeth and slots formed in the edge thereof, means for rotating said bin to permit separate blanks to fall into said slots, said frame having a channel formed therein and leading from the periphery of said bin to the bottom part of said frame, a support for receiving said blanks at the lower end of said channel, a plunger for pushing said blanks off from said support, a spring positioned to prevent said blanks from falling outward from said support, and an extension carried by said plunger for engaging said spring to push it out of the way to allow each of said blanks to drop from said channel as they are moved off from said support.

4. In an apparatus for separately feeding a series of somewhat fragile button blanks to a predetermined position in a machine, the combination of a frame, a bin mounted near the top of said frame for receiving said blanks, said bin having slots formed therein for separately receiving said blanks and for delivering them to a channel formed in said frame, a support at the base of said channel for supporting the lowermost blank edgewise, a plunger with a slot in the face thereof for receiving the lowermost blank as supported on a stationary support, said plunger being located in position to push said blank facewise off said support, a guard for preventing said blank from falling facewise from said support, and an extension on said plunger for engaging said guard for moving the same when said plunger is moved to push a blank from its support to allow said blank to drop from said apparatus.

5. In an apparatus for separately feeding a series of somewhat fragile button blanks to a predetermined position in a machine, the combination of a frame, a bin mounted near the top of said frame for receiving said blanks, said bin having slots formed therein for separately receiving said blanks and for delivering them to a channel formed in said frame, a support at the base of said channel for supporting the lowermost blank edgewise, a plunger with a slot in the face thereof for receiving the lowermost blank as supported on a stationary support, said plunger being located in position to push said blank facewise off said support, a spring guard for preventing said blank from falling facewise from said support, an extension on said plunger for engaging said guard for moving the same against spring action when said plunger is moved to push a blank from its support to allow said blank to drop from said apparatus, a plate with perforations therein for receiving said blanks as they fall from said support, a shaft for rotating said plate, and a cam carried by said shaft and engaging said plunger for operating said plunger and said plate in synchronism.

6. In a machine for cutting, forming and drilling somewhat fragile button blanks, the combination of a rigidly mounted plate for receiving said blanks to be operated upon and having an opening, a plate mounted adjacent to said rigidly mounted plate and adapted to rotate in respect thereto, a series of openings formed in said rotating plate for registering with the opening in said rigidly mounted plate as said rotary plate is rotated, and a button blank feeding apparatus in operative relation to said rotating plate, comprising a rotating bin in said blank feeding apparatus for holding a quantity of said

blanks and for separating them and allowing them to pass into a channel in tandem order, said channel being formed in said apparatus, a support for holding the lowermost blank in said channel edgewise, a plunger mounted to push said lowermost blank facewise from its support, a guide for receiving and directing said blank to one of the openings in said rotating plate, and a cam driven in synchronism with said rotating plate and operating said plunger to deliver a blank to the opening in said rotatable plate nearest said guide.

7. In a machine for cutting, forming and drilling somewhat fragile button blanks, the combination of a rigidly mounted substantially horizontal plate for receiving said blanks to be operated upon and having an opening, a substantially horizontal plate mounted adjacent to said rigidly mounted plate and adapted to rotate about a substantially vertical axis in respect thereto, a series of openings formed in said rotating plate for registering with an opening in said rigidly mounted plate as said rotary plate is rotated, and a button blank feeding apparatus in operative relation to said rotating plate, comprising a rotating bin in said blank feeding apparatus for holding a quantity of said blanks and for separating them and allowing them to pass into a channel in tandem order, said channel being formed in said apparatus and extending downward, a support for seating the lowermost blank edgewise in said channel against downward movement, a guide for receiving and directing said blank from said support to one of the openings in said rotating plate, a plunger mounted to push said lowermost blank from its support facewise onto said guide, and a cam driven in synchronism with said rotating plate and operating said plunger to deliver a blank to the opening in the rotatable plate nearest said guide.

8. In an apparatus for separately feeding somewhat fragile button blanks to a main machine which cuts and drills them, the combination of a frame to be received on said machine, a rotating bin for receiving a quantity of said blanks, said bin being of truncated cone form and having alternate slots and teeth formed therein near its periphery, said slots being adapted to receive said blanks singularly, a channel formed in the frame adjacent said bin for receiving said blanks from said slots and for delivering said blanks in tandem to a support near the base of said frame, a flexible guard for maintaining said blanks from falling from said support, and a plunger positioned back of the lowermost blank and operated to push each lowermost blank from said support and for moving said flexible guard to prevent each blank from being pinched between the guard and said plunger.

9. In a structure for receiving and feeding somewhat fragile button blanks to a main machine for drilling and forming, the combination of a frame to be mounted on said main machine, a shaft positioned near the upper end of said frame, a truncated cone type revolving bin mounted on said shaft, a stationary plate for closing said bin and being supported on said frame, said bin having alternate teeth and slots formed in a periphery thereof, a channel formed

in said frame near the periphery of said bin for receiving blanks from said slots, said channel extending to the lower end of said frame, a support for seating the lowermost blank edgewise in said channel, a spring mounted on said frame near the lower end of said channel for preventing the lowermost blank from falling facewise from said support, a plunger with a slotted face for receiving the lowermost blank as it reaches said support, said plunger being located in position to push said blank facewise off said support, extensions from said plunger for engaging said spring to move said spring as said slotted plunger is moved to push the lowermost blank from its support, a guide for receiving said blank and directing it, a plate positioned horizontally beneath said guide for receiving each released blank, a shaft for driving said plate in synchronism with said machine, and a cam carried on said shaft and functioning to reciprocate said slotted plunger to deliver a blank to one of a series of openings in said plate at predetermined intervals, said cam operating to move said plunger relatively slowly to push a blank from its support and to return it relatively quickly to its normal position within said frame and back of the next blank dropping from said channel.

10. In an apparatus for feeding button blanks and the like successively to a station for operation thereon, the combination comprising a bin for the blanks, a channel chute extending downwardly from said bin and adapted to contain the blanks edge to edge in a single file, means for transferring the blanks from said bin to said channel chute successively, said channel chute having a support at its lower end to seat the lowermost blank therein edgewise, the chute having an opening therethrough transversely thereof above said support, a plunger mounted on one side of the chute for reciprocating movement through said opening and in position to have its end engage the face of the blank on said support and eject it facewise from said chute through said opening, and means for delivering the ejected blank to said station.

11. In an apparatus for feeding button blanks and the like successively to a station for operation thereon, the combination as described in claim 10, comprising a guard located on the other side of the opening for holding the blank on said support from facewise movement towards said other side and movable during the blank ejecting stroke of the plunger to permit ejection of said blank through said opening by said plunger.

FRANCISCO MENDEZ.
RAFAEL O. ALMODOVAR.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
297,496	Campbell	Apr. 22, 1884
577,643	Campbell	Feb. 23, 1897
1,077,335	Dusha et al.	Nov. 4, 1913
1,828,174	Clemens	Oct. 20, 1931
2,433,560	Hurley	Dec. 30, 1947