United States Patent

Hodgins

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[54] VIBRATORY BOWL FOR FEEDING BUTTONS

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[52] **U.S. Cl.**.....**198/33 AA**, 221/157

[51] **Int. Cl.**.....**B65g 47/24**, B65d 83/00

[58] **Field of Search**.....198/33, 33 AA; 221/158, 157, 221/159, 160, 161

[56] **References Cited**

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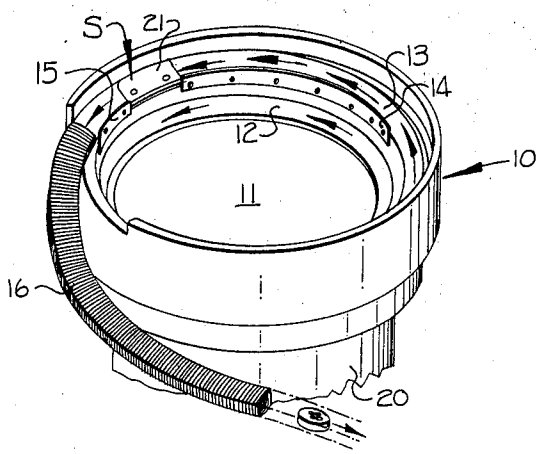
[57] **ABSTRACT**

A button selecting section is provided in the discharge end portion of the upwardly spiraled conveyor track of the bowl for returning improperly orientated buttons back into the bowl and for permitting continued movement of properly orientated buttons to the discharge end of the feeder. The selector section is easily replaceable so that buttons of various sizes may be selected and the selector section is adapted for operation with buttons having a beveled peripheral edge on one side, buttons having a rounded, convex or oval shape on one side, or with buttons having a concave central portion on one side.

4 Claims, 7 Drawing Figures



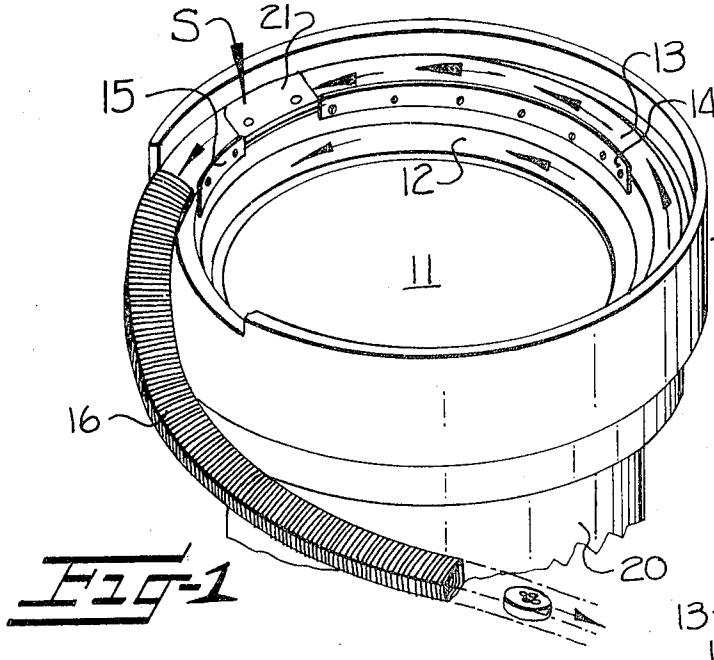


Fig-1

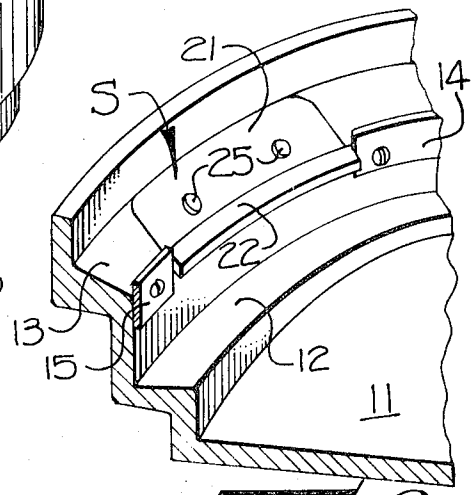


Fig-2

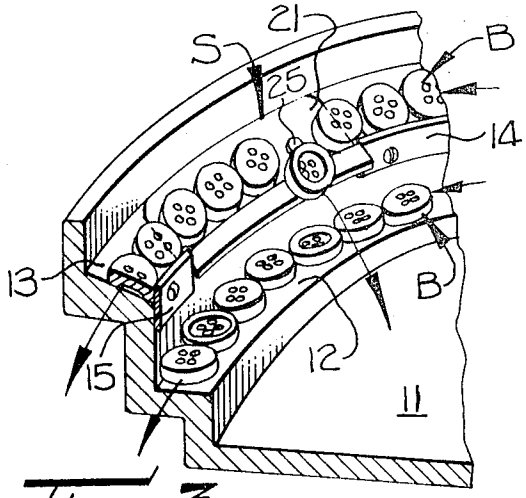


Fig-3

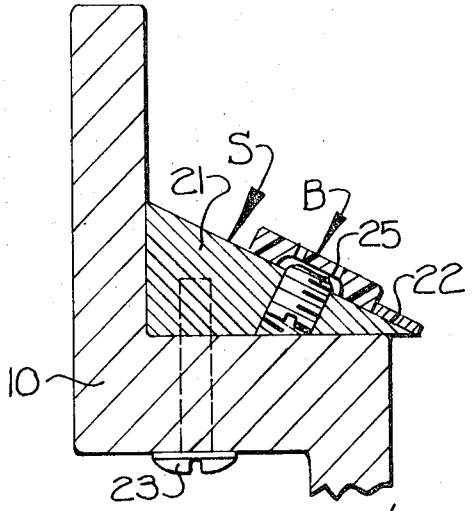


Fig-4

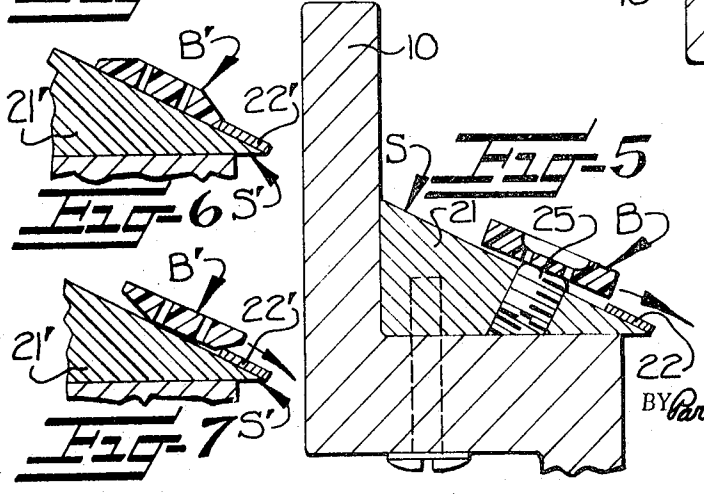


Fig-5

Fig-6

Fig-7

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VIBRATORY BOWL FOR FEEDING BUTTONS

This invention relates generally to a selector for a vibratory bowl for feeding buttons, and more particularly to a selector section which is operable to deliver properly orientated substantially flat buttons while returning improperly orientated buttons back into the bowl.

It is known to utilize a vibratory bowl in the feeding of various types of articles to a discharge point and to utilize a bowl having a track with an inwardly sloping discharge end portion for feeding screws to the discharge end with their stems projecting upwardly. In accordance with U.S. Pat. No. 2,799,383, an overhanging fence is provided to engage the upstanding stems of properly orientated screws so that they are conveyed to the discharge end but those screws which are lying down on the track are returned into the bowl. However, an overhanging fence of the type shown in this patent will not operate to select substantially flat buttons having a beveled peripheral edge on one side or a concave central portion on one side.

It is an object of the present invention to provide button selecting means for use with a vibratory feeder bowl which is operable with substantially flat buttons having a beveled peripheral edge on one side or a concave central portion on one side so that only properly orientated buttons are delivered to the discharge end.

In accordance with the present invention, the button selecting means includes a replaceable selector section having a selector gate extending along the inner portion of the inwardly sloping discharge end portion of the track and projecting upwardly from the track a distance less than the thickness of the buttons so that improperly orientated buttons slide over the selector gate and fall back into the bowl while properly orientated buttons remain in engagement with the selector gate and are moved to the discharge end.

When the present selecting means is used in feeding buttons having one substantially flat side and a beveled peripheral edge on the other side, those buttons which have their substantially flat sides downwardly remain in engagement with the selector gate and are moved to the discharge end. However, those buttons moving along the track with their beveled peripheral edges downwardly will slide over the selector gate and fall back into the bowl.

When the present selecting means is used in feeding buttons of the type having one substantially flat side and a concave central portion on the other side, one or more button raising pins are provided in the inwardly sloping selector section and spaced from the selector gate a distance substantially equal to the radius of the buttons. Those buttons moving along the track with their substantially flat side downwardly are raised a sufficient distance by the pins that they slide over the selector gate and fall back into the bowl while those buttons moving along the track with their concave central portion downwardly are not raised a sufficient distance to slide over the selector gate but remain in engagement therewith and are moved to the discharge end.

Some of the objects of the invention having been stated, other objects will appear as the description proceeds when taken in connection with the accompanying drawings, in which

FIG. 1 is an isometric view looking downwardly on a vibratory feeder bowl, and illustrating the button selecting means of the present invention incorporated in the inwardly sloping discharge end portion of the button conveying track;

FIG. 2 is an enlarged fragmentary isometric view of a fragmentary portion of the discharge end portion of the track and illustrating the present button selecting section incorporated therein;

FIG. 3 is a view similar to FIG. 2 but illustrating a row of buttons moving along the track and with an improperly orientated button sliding over the selector gate to fall back into the bowl;

FIG. 4 is a greatly enlarged vertical sectional view through the selector section with a properly orientated button passing over the button raising pin;

FIG. 5 is a view similar to FIG. 4 but illustrating one of the improperly orientated buttons being raised a sufficient distance by the pin so that the button will slide over the selector gate;

FIG. 6 is an enlarged vertical sectional view of the inner portion of a selector section of the type used to select buttons having a beveled peripheral edge on one side; and

FIG. 7 is a view similar to FIG. 6 but showing the manner in which an improperly orientated button will slide over the selector gate and fall back into the bowl.

The vibratory bowl **10** is generally of the type disclosed in the aforesaid U.S. Pat. No. 2,799,383 and includes a bottom **11** with annular conveyor track means **12** extending upwardly in a spiraled path from the bottom **11**. The lower portion of the track **12** slopes outwardly from the bowl while the upper portion of the track defines a discharge end portion **13** which slopes inwardly toward the center of the bowl. The inwardly sloping discharge end portion **13** is normally provided with an integrally cast upstanding fence which is removed and replaced in accordance with the present invention by a relatively thin sheet metal fence, divided into fence sections **14** and **15**. The fence sections **14, 15** are suitably secured to the inner edge portion of the bowl and extend above the track a sufficient distance to prevent any buttons from sliding off of the sloping track portion **13** falling back into the bowl.

The fence section **15** extends to the discharge end of the track and the button selecting means of the present invention may be positioned at any desired location along the inwardly sloping discharge end portion **13** of the track. Suitable button conveying means is suitably connected at one end to the discharge end of the vibratory feeder bowl and its other end is suitably connected to a button sewing machine or the like for conveying the properly orientated buttons thereto. The conveyor means is illustrated as a spring chute **16** which is formed of wound wire and is of the proper cross-sectional dimensions to convey the buttons therethrough. This type of spring chute **16** is of particular value in use with a vibratory bowl feeder as the vibratory feeder bowl imparts vibration to the spring chute **16**, which aids in conveying the buttons and prevents jamming of the buttons in the discharge chute **16**.

The bowl **10** is supported on a suitable base **20** housing a motor, not shown, which imparts the proper type of vibratory impulses to the bowl **10** to cause buttons B to move along the track **12** and to be successively fed upwardly to the inwardly sloping discharge end portion **13** so that they move along in engagement with the fence sections **14, 15**. The button selecting means of the present invention is broadly indicated at S and is illustrated as being positioned between the fence sections **14, 15**; however, it is to be understood that this button selecting means may be positioned immediately adjacent the discharge end of the inwardly sloping discharge end portion of the track **13**.

The button selecting means S includes a removable track section **21** which has an inclined upper surface corresponding to the inwardly sloping portion of the discharge end **13** of the track. A selector gate **22** is suitably secured along the inner peripheral portion of the track section **21** and extends thereabove a predetermined distance, which is less than the thickness of the buttons B to be moved along the track. If desired, the selector gate **22** may be formed as an integral part of the removable track section **21**.

The removable track section **21** is held in position by any suitable means, such as one or more screws indicated at **23** in FIG. **4**. The screw **23** extends upwardly through a portion of the bowl **10** and is threaded into the removable section **21**. When the selecting means S is utilized in connection with the selection of buttons B of the type shown in FIGS. **3–5**, that is, buttons having a substantially flat surface on one side and a concave central portion on the other side, one or more button raising pins **25** are provided in the removable track section **21** and extend upwardly from the upper surface a predetermined distance. The center of the button raising pin **25** is preferably positioned inwardly from the inner edge of the selector gate

22 a distance substantially equal to the radius of the buttons being fed. The lower portion of the pin 25 is threadably supported in the removable track section 21 and its upper end is rounded and extends above the track section the distance required to properly select the buttons.

As the buttons B are moved along the inclined discharge end portion 13 of the track, they move onto the track section 21 and their inner peripheral portions engage the inner edge of the selector gate 22. As a button B then passes over the button raising pin 25 with its substantially flat side facing upwardly, as shown in FIG. 4, the leading edge portion of the button will be lifted slightly as it moves over the pin 25. However, the button will not be raised a sufficient distance that the inner peripheral edge is raised above the upper edge of the selector gate 22 because the button will be lowered against the track section 21 as the concave central portion passes over the pin 25 so that the button will remain in engagement with the selector gate 22, as shown FIG. 4. Although the button will be raised slightly as its trailing edge passes over the pin 25, it will not be raised above the upper edge of the selector gate 22.

On the other hand, if a button moving along the track section 21 is orientated with its substantially flat side downwardly, as shown in FIG. 5, the button B will be raised as the central portion passes over the pin 25 a sufficient distance that the inner peripheral portion of the button is raised above the upper edge of the selector gate 22. The raised button will then slide downwardly, over the selector gate 22, and fall back into the bottom 11 of the bowl 10. It is to be understood that the button selecting means S may be provided with a single button raising pin 25 but it is preferred that two button raising pins 25 be provided in the removable track section 21. These pins 25 must be spaced apart by a distance greater than the diameter of the buttons being fed so that both the leading and trailing edges of the buttons will not be raised at the same time.

A particular button selecting section may be used with buttons of several sizes, as long as the concave central portion passes over the pin 25. However, if buttons of such a size are to be fed that the concave central portion will not engage the pin 25, the selector section may be easily removed and replaced by another selector section having a selector gate 22 of the required height and having the button raising pin 25 properly positioned to operate with this size button.

Also, the present button selecting means is operable with buttons B' having one substantially flat side and having a beveled peripheral edge on the other side, of the type shown in FIGS. 6 and 7. When used with this type of button, it is not necessary to use the button raising pin in the removable track section 21' and the height or thickness of the selector gate 22' is determined by the amount of bevel on the peripheral edge of one side of the button.

Those buttons B' which are properly orientated and move along the selector gate 22' with their substantially flat surface downwardly, as shown in FIG. 6, remain in engagement with the selector gate and are moved to the discharge end of the track. On the other hand, those buttons B' which are improperly orientated with their substantially flat surface upwardly, as shown in FIG. 7, are not held by the selector gate 22' because the beveled peripheral edge engages and slides over the upper edge of the selector gate 22' and the button falls back into the bottom 11 of the bowl 10. This type of selector section S' will also select buttons having one substantially flat side and which are rounded, convex or oval shaped on the other side.

The button selecting means of the present invention thus operates with buttons having a concave central portion on one side, or with button having a beveled peripheral edge on one side. The button selecting means of the present invention will also operate with buttons which are rounded or oval on one side and substantially flat on the other side. Buttons described in this application as having a beveled peripheral edge on one side are intended to include buttons having a straight bevel, as illustrated in FIGS. 6 and 7, as well as buttons having curving bevels, such as those on buttons which are dome shaped, rounded or oval on one side. Also, a particular selector section will operate with buttons of several different sizes and, if it is desired to feed buttons of other sizes, this selector section may be easily removed and replaced by another selector section having the proper thickness of selector gate and/or a button raising pin which is properly positioned to select the required size of button.

In the drawings and specification there has been set forth a preferred embodiment of the invention and although specific terms are employed, they are used in a generic and descriptive sense only and not for purposes of limitation.

I claim

1. In a device for feeding buttons to sewing machines and the like including a vibratory feeder bowl having a bottom, conveyor track means extending upwardly from said bottom to move the buttons upwardly along and to a discharge end, said track means including a discharge end portion sloping inwardly toward the center of the bowl, a fence extending along the inner edge of said discharge end portion of said track means, and said fence having an upper edge at a sufficient height to prevent any buttons from being displaced from said track; the combination therewith of button selecting means for returning improperly orientated buttons into said bowl and for permitting continued movement of properly orientated buttons to said discharge end, said button selecting means being particularly adapted for use with buttons of the type having one substantially flat side and having a concave central portion on the other side and comprising a selector gate extending along the inner portion of said inwardly sloping discharge end portion of said track means and adjacent said fence, said selector gate extending upwardly from said track means a distance less than the thickness of the buttons, and at least one button raising pin positioned inwardly from the inner edge of said selector gate a distance substantially equal to the radius of the button, said button raising pin having an upper end extending upwardly above said tract means a distance slightly less than the amount of the concavity of the central portion on said other side of said button so that buttons orientated with their one flat side downwardly will be raised a sufficient distance by said pin so that the inner surface will be raised to pass over said selector gate and the button will fall back into said bowl while buttons orientated with their concave central portions downwardly will remain in engagement with said selector gate and be moved to said discharge end.

2. Button selecting means according to claim 1 wherein said button selecting means further comprises a removable track section having an upper surface corresponding with the inwardly sloping discharge end portion of said track means, and wherein said selector gate extends along the inner portion of said removable track section.

3. Button selecting means according to claim 2 including at least one button raising pin supported in said removable track section and being spaced inwardly from the inner edge of said selector gate a distance substantially equal to the radius of buttons to be selected.

4. Button selecting means according to claim 3 including a pair of said button raising pins supported in said track section, and wherein said pins are spaced apart a distance greater than the diameter of the buttons being selected.

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