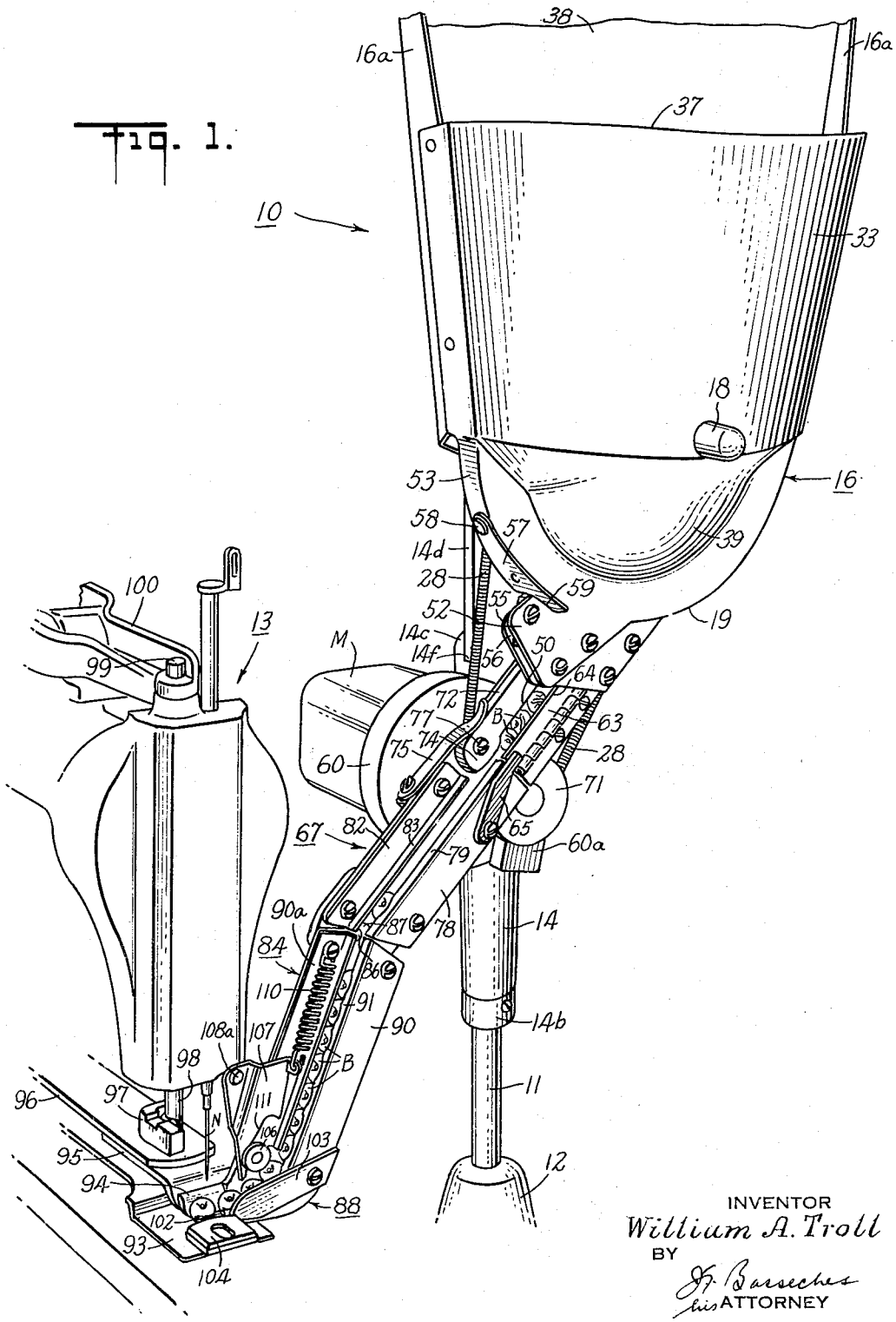
Nov. 14, 1961 W. A. TROLL 3,008,607

BUTTON CLASSIFIER AND FEEDER THEREFOR

Filed Dec. 27, 1956 5 Sheets-Sheet 1

Fig. 1.



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Nov. 14, 1961 W. A. TROLL 3,008,607

BUTTON CLASSIFIER AND FEEDER THEREFOR

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Fig. 2.

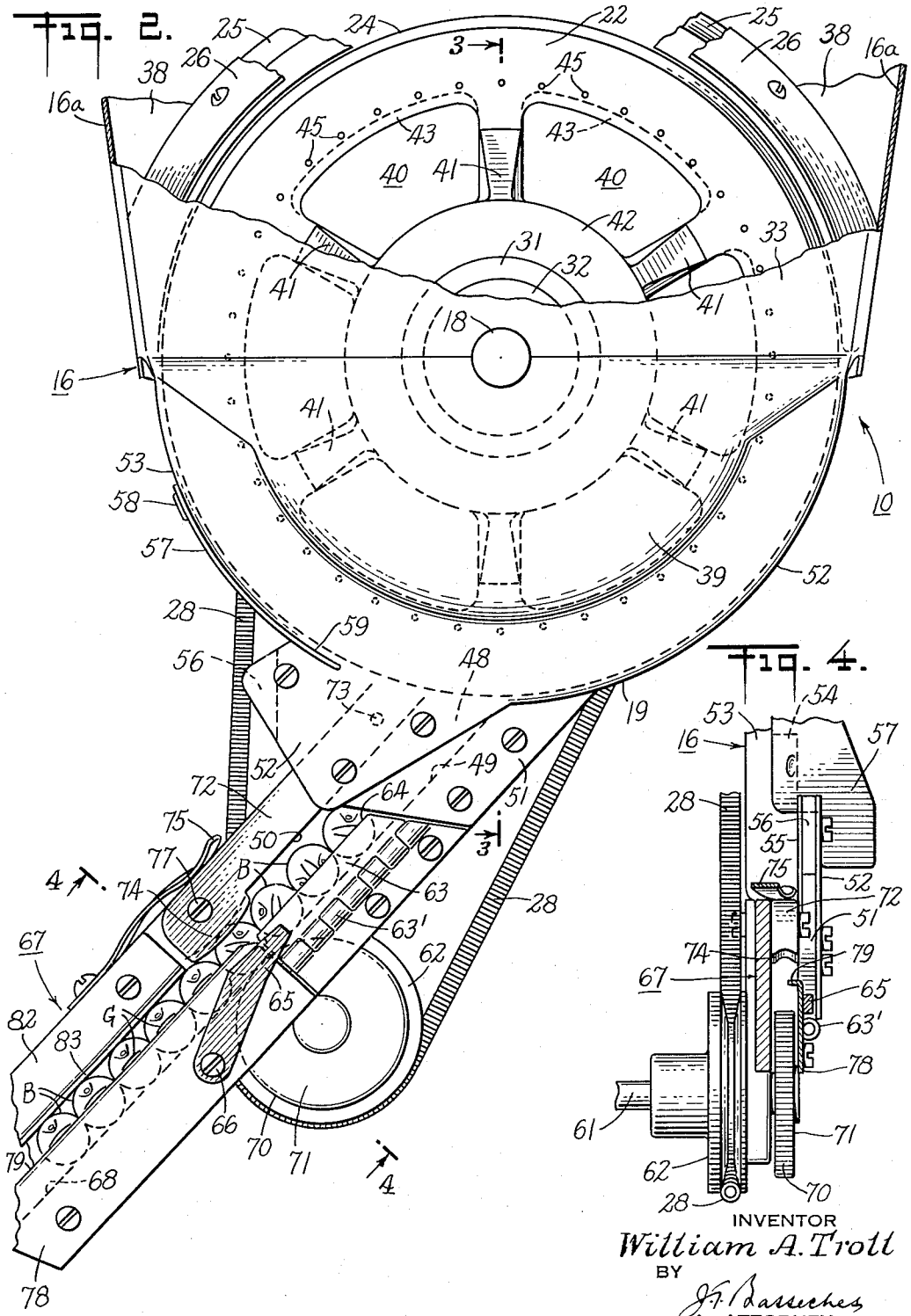


Fig. 4.

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Nov. 14, 1961 W. A. TROLL 3,008,607

BUTTON CLASSIFIER AND FEEDER THEREFOR

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Fig. 3A.

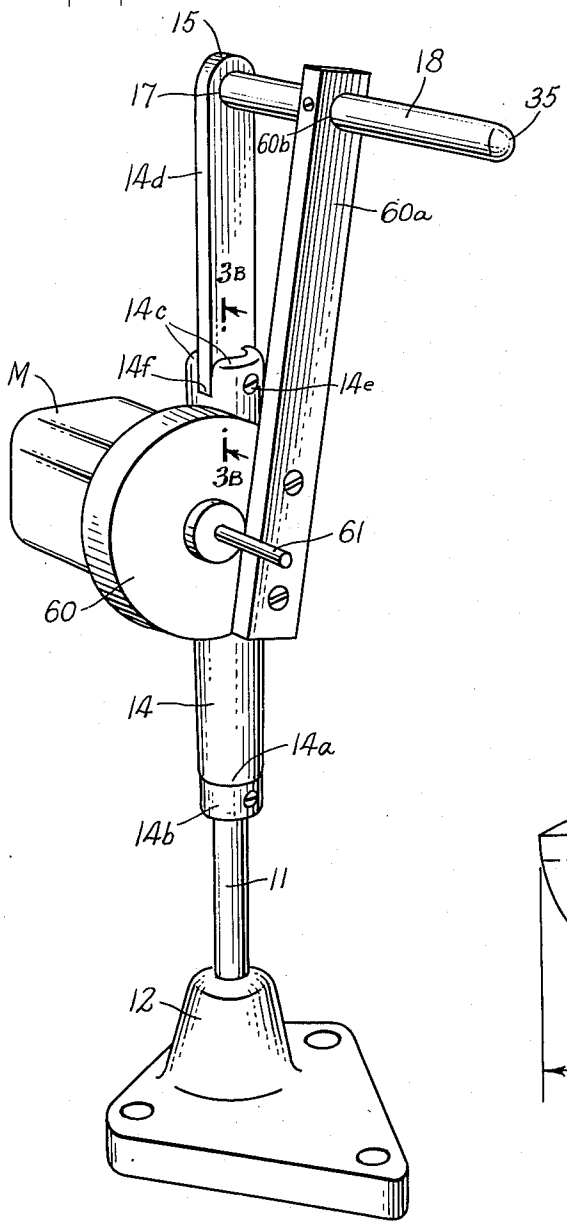


Fig. 3B.

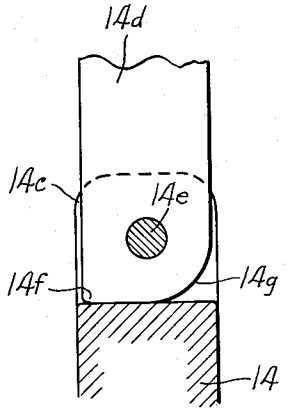
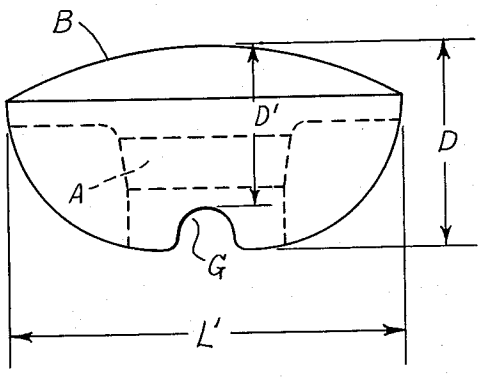


Fig. 3C.



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BUTTON CLASSIFIER AND FEEDER THEREFOR

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Fig. 3.

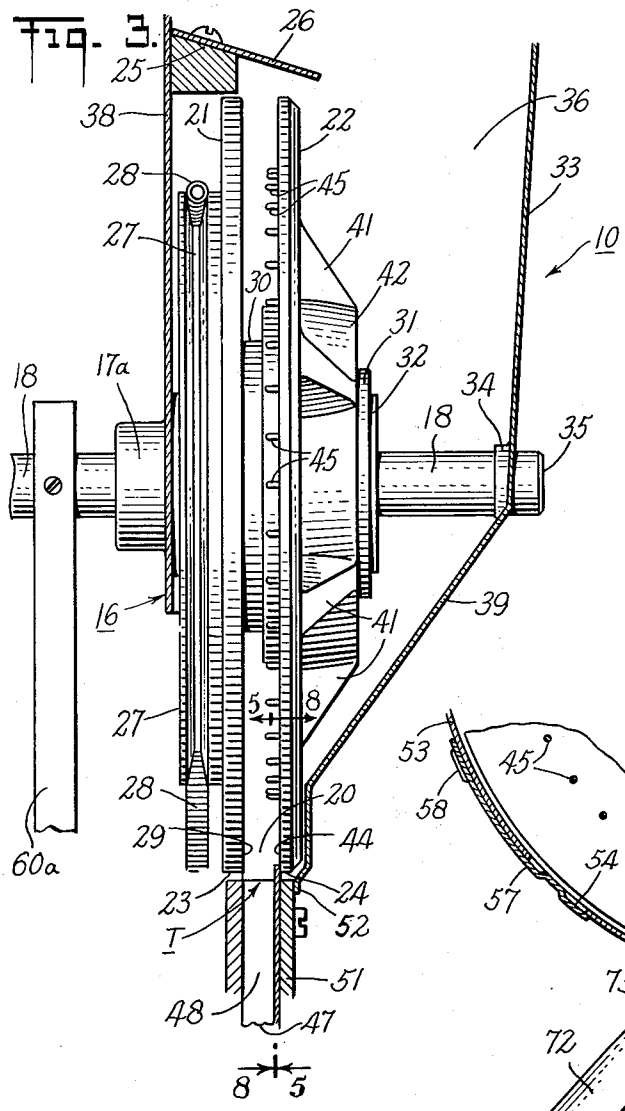


Fig. 6.

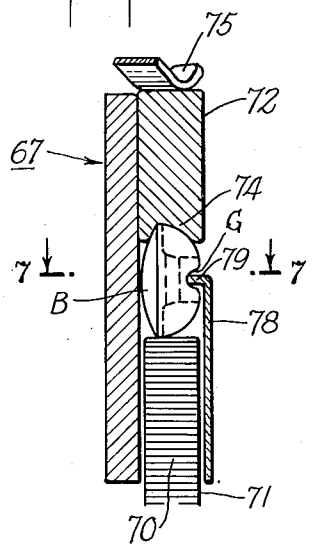


Fig. 5.

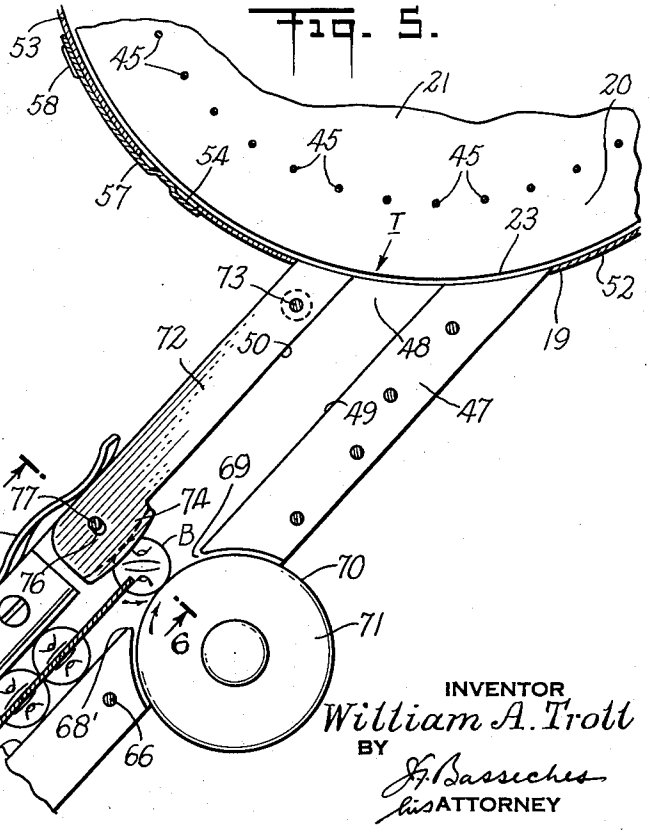
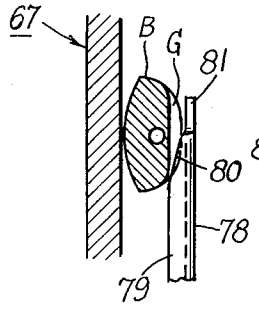


Fig. 7.



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Nov. 14, 1961 W. A. TROLL 3,008,607

BUTTON CLASSIFIER AND FEEDER THEREFOR

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Fig. 8.

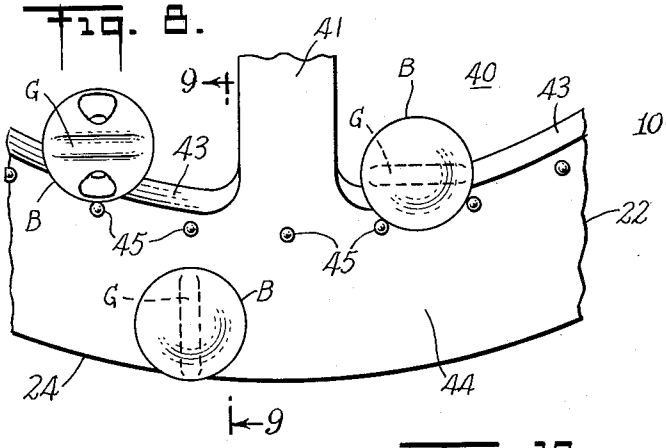


Fig. 9.

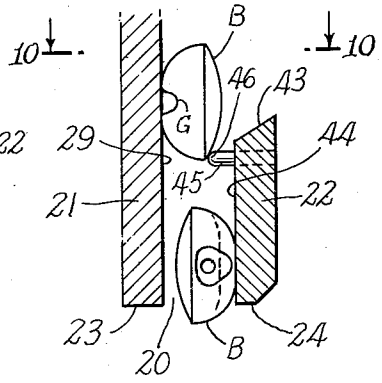


Fig. 10.

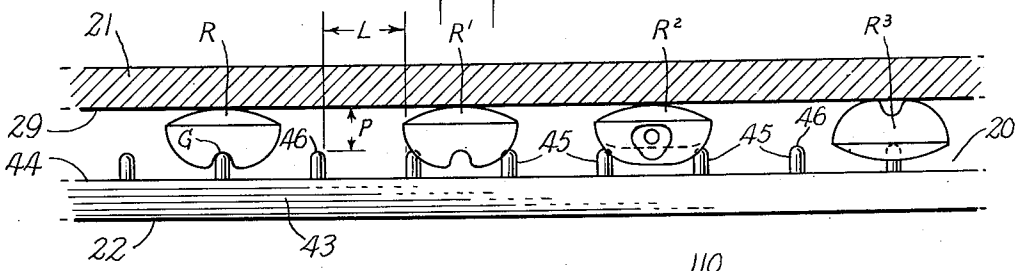
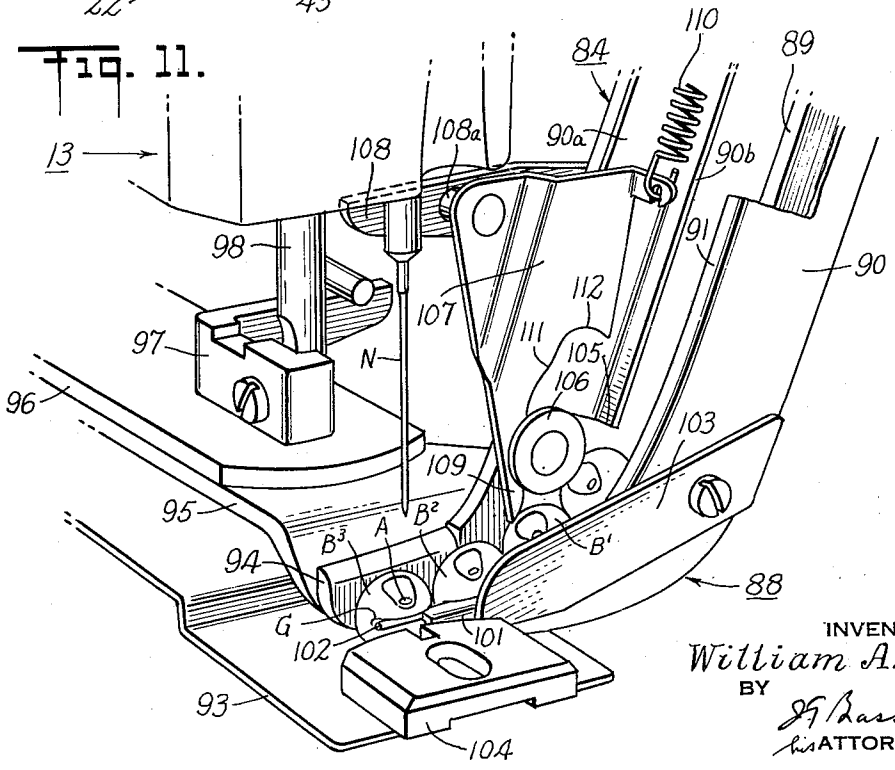


Fig. 11.



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United States Patent Office 3,008,607 Patented Nov. 14, 1961

3,008,607

BUTTON CLASSIFIER AND FEEDER THEREFOR

William A. Troll, Ridgewood, N.Y., assignor to Emsig Manufacturing Company, New York, N.Y., a partnership

Filed Dec. 27, 1956, Ser. No. 630,778
3 Claims. (Cl. 221—167)

This invention relates to button feeders, and more particularly to button orienting and feeding means for use in button sewing operations.

My invention more specifically relates to orienting means for buttons of the self-shank type, and still more particularly to the sewing and feeding of lenticular, shankless buttons more specifically described and set forth in the application of Sidney Emsig, Serial No. 584,025, filed May 10, 1956, entitled Button, now Patent No. 2,939,-191 of June 7, 1960, and carries out improvements of my related application Serial No. 604,236, filed August 15, 1956, entitled Methods for Holding Buttons for Sewing and Holding Means Therefor, now Patent No. 2,934,-032 of April 26, 1960.

My invention particularly has for its object making it commercially economically possible to effect sewing operations of shankless buttons, particularly shankless buttons of a generally lenticular configuration.

Among the objects of the invention is the provision of feeding means for buttons of the character described as applicable to automatic button sewing machines whereby with each automatically performed cycle of button sewing, the button will be brought into sewing position, oriented with the sewing hole thereof in respect of the path of the needle. In its more specific phases, the objects of the invention are to provide a feeder so that the cycle of raising the presser foot means to permit the location of the work in position for affixing the button and releasing the presser foot to set into motion the mechanism to carry out the stitching operation, will be accompanied by a positioning of the next button and an ejection of the button sewn to the work, all accomplished without manual handling of the button and accomplished as rapidly as the cycles of sewing can be effected.

While automatic feeding of buttons of the self-shank type and sew-through type have been successfully accomplished in my Patents Nos. 2,597,912 of May 27, 1952 and 2,661,709 of December 8, 1953, the adaptation of said feeders to self-shank buttons, particularly of lenticular outline, has encountered obstacles due to the relatively symmetrical contour of lenticular buttons.

Furthermore, while the retention of shank buttons in sewing position against the work has been demonstrated as feasible by one of my patents aforementioned, the very minute and limited extension of the substantially semi-spherical surface of a lenticularly shaped button has heretofore confined the use of this button to manual sewing operations, notwithstanding its highly desirable properties, structurally and ornamentally.

Accordingly, it is an object of my invention to provide a button classifying assembly whereby buttons of symmetrical outline, including shankless buttons or those approaching a lenticular outline, may be quickly and facilely fed in oriented position for use in attachment to work, either for manually handling the same or for automatically feeding the same to an automatic feeder as part of an automatic button affixing or sewing machine.

Still more particularly, it is an object of this invention to provide a button classifier for orienting buttons of lenticular shape continuously, whereby they may be quickly and efficiently fed to a button fixing device.

Still more particularly, it is an object of this invention to provide a button classifying device for orienting buttons, particularly of the self-shank contour or lenticular

outline, from a bulk supply to an automatic button affixing device whereby the button affixing operation may be quickly and automatically conducted.

Still more particularly, it is an object of my invention to provide a feeder for lenticularly shaped buttons whereby such buttons may be quickly and effectively sewn to the work.

To attain these objects and such further objects as may appear herein or be hereinafter pointed out, I make reference to the accompanying drawings, forming a part hereof, in which:

FIGURE 1 is a perspective view showing a feeder assembly in accordance with this invention;

FIGURE 2 is a magnified sectional view of a classifying hopper; with parts broken away;

FIGURE 3 is a section taken on the line 3—3 of FIGURE 2;

FIGURE 3A is a perspective view of the standard for the hopper;

FIGURE 3B is a fragmentary section taken on the line 3B—3B of FIGURE 3A;

FIGURE 3C is a side elevation of a button to be used in the assembly;

FIGURE 4 is a fragmentary sectional view taken on the line 4—4 of FIGURE 2;

FIGURE 5 is a fragmentary sectional view on the line 5—5 of FIGURE 3;

FIGURE 6 is a magnified sectional view taken on the line 6—6 of FIGURE 5;

FIGURE 7 is a sectional view taken on the line 7—7 of FIGURE 6;

FIGURE 8 is a fragmentary view taken on the line 8—8 of FIGURE 3;

FIGURE 9 is a fragmentary section taken on the line 9—9 of FIGURE 8;

FIGURE 10 is a magnified sectional view taken on the line 10—10 of FIGURE 9;

FIGURE 11 is a magnified, fragmentary, perspective view of the lower portion of FIGURE 1.

My invention may be summarized in providing a classifier for self-shank buttons, particularly applicable to a bulk source of such buttons, as are of substantially lenticular outline and have front and rear faces which are substantially symmetrical to each other and include a thread aperture running along the front and rear faces, and a circular rim edge, which offer difficult problems in orienting not present in shank buttons. Thus, in accordance with the features of my invention, substantially symmetrical shapes may be oriented at high speeds for coupling to a button feeder of a button sewing machine, to assure a continuous flow of the buttons in consonance with the speed at which automatic button sewing operations may be conducted.

Other features of the invention reside in the provision of a combined classifying hopper and button feeder for lenticular buttons of the character described, which will assure an abundant supply of oriented buttons without interruption, and minimizing any interruption in edge-to-edge contact of a series of buttons in the chute leading to a button sewing machine.

Other features of my invention reside in the provision of a button feeder for buttons of lenticular or substantially spherical outline, heretofore presenting unusual difficulty in manually and automatically feeding to a button sewing machine.

Still more particularly, the invention resides in the provision of a button feeder for a lenticularly shaped button, to orient the thread receiving aperture quickly and automatically, notwithstanding the absence of projecting faces normally found in shank buttons or unsymmetrical sew-through buttons, whereby this type of

highly ornamental button may be practically put to use at speeds of operation heretofore not attainable.

I now make reference to the drawings, wherein it is to be noted that the phases of my invention fall into the following categories:

I—A classifying hopper;
II—A feeder chute; and
III—A presser foot button sewer and ejector.

I—*The classifying hopper*

It is to be noted at the outset that the classifying hopper now to be described concerns itself, in its specific form, with the classification of buttons of substantially lenticular outline, in which the front face and the rear face are substantially symmetrical, having a contour which may approach a spheroid, without any projecting shank locating the thread receiving hole to run between the opposed faces.

It is an object of this invention to utilize the features of construction of the button covered by the Emsig application aforementioned, and particularly the knot cavity or groove thereof, to make possible a rapid, accurate and continuous flow of such buttons to keep pace with high speed automatic button sewing machines.

In the figures, a hopper 10 is arranged to be supported on a standard 11 having a base 12, affixed to a table top on which the button sewing machine 13 is mounted. The standard 11 receives a sleeve 14 which, at its lower end 14*a*, rests on a collar 14*b*, adjustably connected to the standard 11.

The sleeve 14, at its upper end, is bifurcated to provide the spaced arms 14*c*, between which the vertical arm 14*d* is pivotally held by the pin 14*e*. An edge 14*f* is arranged to engage the bottom wall between the arms 14*c* to act as a stop rearwardly. A curved edge 14*g* permits forward tilting of the arm 14*d* within limits, as will appear herebelow.

The arm 14*d* has adjacent its upper end 15 provision for means for mounting the hopper housing 16. A bearing or like aperture 17 supports the shaft 18 which extends substantially horizontally. The housing 16 has a rearwardly extending boss 17*a* through which the shaft 18 extends and thereby supports the housing pivotally.

Side flanges 16*a*—16*a*, extending forwardly for a limited portion thereof but terminating adjacent the boss 17*a*, removably support the cover of the hopper and have a bottom wall 19 forming a circular raceway 20, into which the rear flange member 21 and the spider 22 fit. The rear flange member 21 and the spider 22 are keyed to the shaft 18 for rotation, to extend the peripheral edges 23 and 24 in close adjacency to the raceway 20.

At its upper portion, the housing 16 has an angularly directed edge wall 25 of semi-circular outline to which the shield 26 is removably affixed, completing, with the bottom wall 19, a complete peripheral raceway extending over the peripheries 23 and 24 of the flange and spider, respectively.

The flange member 21 has extending from its rear face a pulley 27 for rotational driving by the belt 28, as will appear more clearly as this description proceeds.

The flange member 21 has its front face 29 formed with a smooth guide surface terminating axially in an axial race 30, spacing the spider 22 therefrom. The spider 22 consists of an axial boss 31 fitting over a boss 32 extending from the flange member 21, so that the flange member 21 and spider 22 may rotate in unison in spaced relation to each other on the shaft 18. A front cover 33 has a bearing flange 34 sleeved on the outer end 35 of the shaft 18, to provide a chamber 36 to one side of the spider. An edge 37 of the cover 33 cooperates with an extension wall 38 of the housing 16, to provide a filling aperture to the chamber 36.

The cover member 33 has a guide wall 39 enclosing the front face adjacent the periphery of the spider 24 for a distance axially inwardly of the spider channels 40, six in number, each defined by radial spokes 41, axially by the hub 42 and peripherally by the ledge 43 which flares angularly toward the raceway 20. The channels 40 form passages connecting the chamber 36 with the raceway 20, the latter being controlled as to depth with regard to the distance from the guide face 29 to the spider face 44, substantially to conform to the depth D of a button B (see FIGURE 3C).

The face 44 of the spider 24 adjacent the raceway 20 is blocked by button limiting means comprising pegs 45 arranged peripherally adjacent the ledges 43. The distance L between the button limiting pegs 45 is less than the diameter L' of the button B. The ends 46 of the button limiting pegs extend into the raceway for a distance defining a passage P approximately equal to the thickness D' of the button, and therefore for a distance less than the depth D at any other section of the button which is thickest to either side of the groove G.

The housing adjacent the raceway has an extension arm 47 formed with a longitudinal groove 48 defined by the edge wall 49 on the lower side and by the edge wall 50 on the upper side. The groove 48 corresponds substantially to the diameter L' of the button, forming a throat T leading to the raceway. An extension plate 51 covers the groove 48 adjacent the throat T, to limit the throat T, for purposes which will appear as this description proceeds.

The cover 33 has edge flanges 52 and 53 substantially diametrically enveloping the raceway, limited adjacent the edge 49 of the edge walls of the throat T. An auxiliary throat 54 is angularly extended above the extension arm 47 and combines with a back plate 55 to form a discharge channel 56, leading to the raceway. A closure 57 is pivoted by the pin 58 at one end and enters into the slot 59, removably to block the auxiliary throat, for purposes which will appear as this description proceeds.

With the construction described, front and rear orientation of buttons of the character aforementioned is obtained by furnishing a bulk of buttons and depositing the same in the chamber 36. Agitation by rotation of the spider is then effected. For this purpose, a motor M is mounted on a bracket 60 supported and bolted to the arm 60*a* which has a bearing 60*b* through which the shaft 18 passes. The arm is adjustably held on the shaft by the set screw at the edge of the arm, to engage the shaft 18. The motor has a drive shaft 61 substantially in parallelism with the shaft 18. The drive shaft 61 is provided with a pulley 62 for driving the belt 28, which extends over the pulley 27. The motor M may be rotated constantly, thereby continuously to drive the pulley 27 and the spider assembly coupled therewith.

The spider provides tumbling means to present the buttons under agitation through the channels 40, progressively reaching the raceway 20 previously described when the button limiting means in the form of the pegs 45 permits the buttons to pass radially outwardly under conditions exemplified in FIGURES 8, 9 and 10, and limited as to rear and face orientation when the button groove G straddles the ends 46 of the pegs 45. This is exemplified in the condition R shown in FIGURE 10, the condition of buttons at R', R2 and R3 exemplifying various possible positions of the button with respect to the limiting means or pegs 45. R3 particularly exemplifies a position which will preclude a button from ever reaching the raceway since the spacing L between pegs, as well as the length of the pegs, would prevent discharge from the channel to the raceway.

By the constant agitation of the spider, a quick orientation of the buttons is achieved, and the buttons are arranged in the raceway where, in an edgewise position of the buttons, they may roll continuously under the constant rotation of the spider and will not offer any material friction resistance as the buttons are rolled to a position up to the throat T or away from the same. The presence of a button in the throat T, accordingly, will cause no interference to continuous rotation.

Discharge of the buttons may then be effected through the throat T along the groove 48 or, optionally, through the auxiliary throat 54, by pivotally moving the closure 57 to unblock the auxiliary throat and thereby permitting the emptying of the hopper through the channel 56.

The construction described provides a front to rear oriented position of the buttons as they emerge from the throat T along the groove 48.

Should it be found desirable manually to remove a button from the groove 48, there is provided along the extension 47 a closure 63 which is removable by pivoting on the hinge 63', and which provides a ledge 64 substantially medially across the groove 48, thereby restraining lateral discharge of the buttons along the groove 48 except when the closure 63 is pivoted out of position. A latch 65, pivoted by the pin 66 on the chute segment 67, maintains the closure 63 in the groove covering position.

The assembly thus far described provides a first stage orientation of the buttons discharged through the throat T, at which point, as described, the closure 63 may be opened for manual removal of buttons. This initial orientation provides means for readily handling the buttons, if this alone is the desired position. The assembly, however, is primarily arranged for use in an automatic feeder which will now be described.

II—*The feeder chute*

The extension arm 47 previously described is aligned with the chute segment 67, which is provided with a guide wall 68 in alignment with the edge wall 49 of the extension 47. The contiguous portions of the edges 49 and 68 are provided with a cutout 69 into which the peripheral edge 70 of the friction wheel 71 extends, to position the edge in alignment with the walls 49 and 68. The wheel 71 is driven by the shaft 61 of the motor M previously described. Buttons reaching the gap of the cutout 69 are thereby brought into peripheral contact with the friction wheel 71 by reason of the continuous rotation of this member.

The upper edge of the chute groove 48 is providede with a pressure arm 72, pivoted beneath the extension 54 by the pivot pin 73. A pressure finger 74 contacts the upper edge of the button under the pressure of the spring 75, to maintain the button in contact with the friction wheel 71, thereby providing a guide slot 76 into which the pin 77 extends, yieldably to provide friction restraint and detent action on the button reaching the position beyond the point of tangency of the friction wheel 71 and the edge 49. The friction wheel rotates clockwise as viewed in FIGURE 2, imparting counterclockwise rotation to the button in contact with the periphery 70 of the wheel.

The pressure finger 74, as it contacts the button, is channeled, as more clearly shown in FIGURE 6, to restrain the button against lateral displacement as it is rolled by the friction wheel 71 and moves along to encounter the leading edge 68' of the chute segment 67. At this portion, the guide wall 68 is overlapped by the cover plate 78 having an inwardly directed flange 79 which includes a tapering gate 80 adjacent the edge 81. As the button is rotated by the friction wheel 71, the button first comes in contact with the cover plate 78 adjacent the edge 81, and then in contact with the gate 80, which is positioned to be aligned with the groove G of the button when it is rolling on the edge 68. Thereupon the button may gravitationally slide along the downwardly, angularly directed chute edge 68 and is maintained oriented by reason of the flange 79, holding the button against further rotary movement as it gravitates along the chute section, the end section 67 being provided along its length in opposition to the cover 78 with an angle plate 82, having a lengthwisely extended lip 83 edgewisely covering the edges of the row of buttons in the section 67.

The chute section 67 is coupled to the chute section 84, constructed in all respects along its primary length complemental to the chute section 67. Articulation is provided by a joint formed by the plate 85, which carries the pin 86 in coupling engagement with the ear 87. The chute section 84 terminates in a presser foot segment 88, the related details of which will now be described.

III—*The presser foot button sewer and ejector*

The presser foot segment 88 adjacent the chute section 67 has a guide wall 89 aligned at its upper edge with the guide wall 68 of the section 67. A cover plate 90 is formed with a flange 91 arranged to extend into the button groove G of the row of slidably mounted buttons in a manner similar to the flange 79 previously described, following however the contour of the elbow 92 which is arranged to extend substantially in parallelism to the work holding member 93. The chute segment 84 likewise includes a horizontally extending segment 94 and is affixed to the flange 95 of the work holding clamp 96 of the button sewing machine, the work holding clamp 96 having a block 97 adapted to be hooked to the lifting bar 98, whose upper end 99 is coupled to the lifting lever 100 in a manner well known in the button sewing machine of the type known as the Singer Button Sewing Machine #114.

The clamp arm 96 thereby is periodically and cyclically raised with each button sewing cycle, thereby to raise the horizontally extended presser foot segment 94, and with it to pivot the chute segment 84, further articulation being secured about the shaft 18 and the pin 14*e*, previously described.

The cover plate 90, at the presser foot segment 88, terminates in an angular branch 101 which merges into a pin 102. The branch 101 is resiliently urged against the segment 94 by the leaf spring 103 which pinches the buttons B2 and B3, frictionally to hold the buttons in the presser foot section adjacent the anvil 104.

The pin 102, being an extension of the flange 91, engages the groove G of the button and holds the button with the thread receiving apertures A vertically oriented in opposed position to the needle N. The row of buttons slidably gravitates in the channel of the chute segment 84, oriented under the guidance of a cover section 90, and is further held against tiltable transverse displacement by the complemental cover section 90*a*. A lateral flange 90*b*, formed outwardly from the cover 90*a*, overlies the edges of the buttons from adjacent the end of the section 67 to and adjacent the edge 105 immediately above the elbow 88. Adjacent the terminal portion 105 of the cover section 90*a*, there is positioned a pawl guide 106 comprising a rotatable flange wheel, to one side of which extends the pawl 107, pivotally mounted on the pivoted lever 108 by the pin 108*a*, the lever 108 extending into contact with the lower edge of the sewing machine head, with which it is kept in contact.

The pawl 107 has a feeder finger 109 which may engage the edge of the button. The pawl 107 is biased by the spring 110, to urge the camming face 111 into contact with the wheel 106, acting as a follower for the cam 111, as well as to bring the lever 108 into contact with the head of the machine.

The cam 111 may include a compound cam surface to provide, in relation to the follower and guide 106, a compound retracting and swinging movement terminating against the stop 112 as the limiting position, in a manner more specifically described in my application Serial No. 397,144, filed December 9, 1953, now Patent No. 2,830,549, of April 15, 1958, accurately to bring the button B2 into sewing position and to discharge the sewn button.

The sewing cycle of the machine described includes a work holding position wherein the button B3, held by the finger 102, presses against fabric overlying the anvil 104. With the installation as described, the button has been

oriented so that its aperture A is aligned to receive the needle N during the back and forward jogging action of the needle where the work is stationary (or to be moved in relation to the needle, in the case of installations of button sewing machines where the work is jogged). In either case there is a release of the mechanism of the button sewing machine to lift the presser foot by means of the lift bar 98. This action drives the segments 84 upwardly to actuate the feeder pawl 107 so that the pawl finger 109 is swept to enter between the buttons B1 and B2 by engagement with the flange follower wheel 196, sliding the button B2 to the position previously occupied by the button B3 and ejecting the sewn button with the work.

The succeeding operation, by treadle means known in this type of button sewing machine installation, releases the presser foot into work holding engagement, with the button B2 properly aligned adjacent the anvil 104 and the needle N. Here the sewing cycle is repeated, the stitching being effected through the aperture A of the button, and successively about the pin 102, to enter the fabric pinched by the pin 102 of the presser against the anvil 104 with the required amount of loops as used in affixing self-shank buttons. The pin 102 and the fabric to which the button is sewn determine under thread tension the length of the thread loop. The penetration of the pawl finger 109 between adjacent buttons in the B1 and B2 position does not undesirably cant the buttons under the restraining influence of the flange 91 entering the groove G, so that jamming of the buttons rearwardly is thereby avoided.

From the foregoing it will be observed that the classifying hopper as provided by me assures an edge to edge arrangement of the buttons in face and rear oriented position, providing a supply which will keep pace with high speed withdrawal as the circumstances of the feeder may require. This is accomplished without the chance of blocking of the throat of the hopper or the need for employing slip belt motorized driving means, due to inactivity at intervals in the sewing cycle.

Furthermore, a relatively wide range of sizes of buttons may be handled by the same hopper, where the button thickness remains substantially constant, limited only by the distance of the channel limiting means 45 to the periphery and the spacing between these members to be less than the diameter of the button, further limitation as to a range of sizes being a factor of the yieldability of the arm 72 and the slot 76 to keep the buttons in contact with the wheel 71.

These advantages are further achieved by effecting the orientation in two stages, each employing a rolling action as the buttons are fed from the bulk source to the chute leading to the button presser foot assembly.

By the employment of chute means having a guide engaging the button indentation or groove, including the indentation engaging flange 79 which guides the buttons seriatim edgewise, a relatively wide range of button sizes may be employed with the same chute, where the buttons have a depth of substantially the same magnitude, requiring merely the maintenance of the flange 79 adjacent the midpoint of the button in relation to the gate 80 with respect to the point of tangency to the periphery 70 of the wheel 71.

By the employment of a presser foot including the indentation or rear slot engaging pin 102 as described, the buttons are maintained against tilting or canting within the chute, making possible the feed of the buttons to eject the same by engagement extended to within the chute channel. This operation avoids blocking or jamming, notwithstanding an extensive pressure head of a row of buttons as a continuous column.

By the provision of the pin 102 directed to extend within the body of the button, to hold the buttons in oriented position during sewing, a predetermined tension of the thread loop to the work may be secured, while retaining the button erect on the face of the work, thus effecting economies in labor by eliminating the manipulation of the button along the thread to present such relationship.

In general, high speed feeding of shankless buttons is thereby provided, to maintain the supply of buttons in pace with the button affixing mechanism.

Having thus described my invention and illustrated its use, what I claim as new and desire to secure by Letters Patent is:

1. A classifier for shankless buttons which are each of substantially lenticular outline and have a thread aperture running rearwardly of the front face and include a clearance groove portion of rectilinear outline diametrically of each of said buttons and to one side thereof on the back face, said classifier comprising, in combination, a hopper forming a chamber for a bulk supply of such buttons, a circular raceway having a flange member consisting of a smooth guide surface throughout its extent forming a facewise contacting support for said buttons whereby a supply of buttons is edgewisely arranged in said raceway, a discharge outlet throat opening leading to said raceway for discharging said buttons edgewisely, tumbler means having channel means between said chamber and raceway, said tumbler means being rotatably mounted in said chamber to agitate said buttons in said chamber and move the buttons from said chamber into said channel means, thereby to be fed to said raceway, said tumbler means having button thickness limiting means extending toward the guide surface of said flange member on which and between which last means and flange member the buttons are edgewisely rotated on the rims thereof, the said button thickness limiting means cooperating with the flange member and the opposed guide surface to limit the passage of the buttons to the raceway, said button thickness limiting means conforming to a section of said clearance groove portion and active along the thickness of the buttons through said clearance groove portion to permit passage of buttons from said chamber to said raceway only when oriented facewise to contact said guide surface of said flange member.

2. A classifier for shankless buttons in accordance with claim 1 wherein said raceway includes an auxiliary outlet opening to one side of said discharge throat opening at the lower edge of the raceway and said auxiliary outlet having a movable closure for discharging said raceway of a quantity of buttons at a position located on one side of said first discharge outlet opening, and motorized means for actuating said tumbler means for discharging buttons through said auxiliary opening when the movable closure is removed, thereby diverting said latter quantity of buttons from said first discharge outlet opening under continuous operation of said motorized means.

3. In a button classifier for shankless buttons which are of substantially lenticular outline and of circular edge rim, said buttons having a thread aperture running rearwardly of the front face, with a substantially recilinear, diametrically extended groove on the back face, the combination of a hopper including a first orienting means to discharge oriented buttons from said hopper into a first chute segment in predetermined position with regard to the face and the groove of the buttons, secondary orienting means, said secondary orienting means comprising rim rolling means along said first chute segment, a second chute segment connected with said first chute segment having passage means into which said buttons from the first orienting means may slide, said second chute segment having a chute bottom with overlapping cover plate means, between which chute bottom and plate means the buttons are held slidably therethrough, said last means including a flange centrally of the chute and linearly directed with respect to said latter chute, said flange on said plate means extending toward but spaced from said second chute bottom and extending along said second chute segment and entering and conforming to the said groove on the back face of the button, and providing slidably engaging means in the path of the buttons, slidably guiding button along

said second chute segment, with the thread aperture in an oriented position normal to said flange.

References Cited in the file of this patent

UNITED STATES PATENTS

1,079,967	White	Dec. 2, 1913
1,086,429	Wetmore	Feb. 10, 1914
1,466,662	Kryzanowsky	Sept. 4, 1923
1,575,596	Warner	Mar. 2, 1926
1,775,141	Risser	Sept. 9, 1930
1,861,186	Littell et al.	May 31, 1932
2,033,988	Johnson	Mar. 17, 1936
2,040,851	Johnson	May 19, 1936
2,369,785	Kuehlman	Feb. 20, 1945
2,406,516	Treciokas	Aug. 27, 1946