ABSTRACT OF THE DISCLOSURE

A hopper has a bottom wall downwardly inclined and provided with an opening of predetermined outline. A slideway extends from below the opening downwardly inclined, and has a lower end portion. Guide means is provided on the slideway so as to receive and position for sliding movement articles which are accommodated in the hopper, and which are ejected therefrom with predetermined orientation through the opening in the bottom wall by an agitating device arranged in the hopper. A die is located adjacent the lower end of the slideway for affixing the articles of moving along the slideway to a support, such as a woman's handbag or the like. Means is provided for letting only the respectively leading article on the slideway advance to the die while retarding or restraining the others on the slideway until the respectively leading article has been processed, such as by being affixed via the die to a support.

BACKGROUND OF THE INVENTION

The present invention relates to an apparatus for affixing small discrete articles to supports. More particularly, the invention relates to an apparatus for affixing fittings to women's handbags, or to other items.

The affixing of fittings to women's handbags or other items by means of suitable apparatus is hardly new. The feeding of the fittings in the apparatus to the processing station of the latter from a suitable hopper, is also known. However, certain types of flights have heretofore not been readily feedable to the operating station of such apparatus, and in addition, a problem exists with supplying the fittings to the operating station—that is in effect to the operator—in an automatic sequence neither faster nor slower than the operator's ability to operate the apparatus for affixing the individual fittings to the support, such as handbags or the like. Of course, attempts at accomplishing this have been made before, but the result always has been a complicated expensive arrangement which, if it was operative in the desired manner, was not only expensive but highly susceptible to breakdowns and/or malfunctions as a result of its complexity.

SUMMARY OF THE INVENTION

It is, accordingly, a general object of the present invention to overcome these disadvantages.

A more particular object of the present invention is to provide an apparatus of the type in question which is capable of supplying small discrete articles for affixing to supports, to a working station or operating station in an automatic sequence.

Another object of the invention is to provide such an apparatus wherein the articles are supplied to the working station in such a manner that they arrive thereat in a timing commensurate with the speed at which the operator is capable of operating the machine.

A further object of the invention is to provide such an apparatus which is simple and inexpensive, but which by virtue of its simplicity is highly reliable.

The invention resides in an apparatus for affixing small discrete articles to supports, which apparatus comprises—briefly stated—hopper means having a bottom wall provided with an opening of predetermined outline and adapted to accommodate a plurality of small discrete articles of predetermined configuration. Slideway means extends from below the opening to a location laterally and downwardly spaced from the hopper means and has a lower end portion. Guide means is provided on the slideway means and configured for receiving and guiding the articles for gravity descent along the slideway means, while maintaining them at a predetermined orientation. Affixing means, such as a die, or the like, is arranged proximal to the lower end portion of the slideway means and operative for affixing the respectively leading article to a support. Finally, I provide retarding means associated with the affixing means and operative for retarding articles on the slideway means at a location upwardly spaced from the aforementioned end portion while the respectively leading article is being affixed by said affixing means, and for permitting advance of the next-following article to the affixing means only subsequently thereto.

I wish it to be understood that when I refer herein to the small discrete articles as fittings for handbags and other items, this is by way of example only because such articles may evidently be of a different nature and be affixed to different items, rather than handbags. However, the apparatus according to the present invention is especially suited for this application and for purposes of convenience it will be described hereafter with reference thereto, with the understanding that this exemplary description is not to be considered limiting in any sense.

The novel features which are considered as characteristic for the invention are set forth in particular in the appended claims. The invention itself, however, both as to its construction and its method of operation, together with additional objects and advantages thereof, will be best understood from the following description of specific embodiments when read in connection with the accompanying drawing.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a somewhat diagrammatic perspective view illustrating an apparatus according to the present invention;

FIG. 2 is a fragmentary detail view showing details of the hopper and slideway means of the apparatus shown in FIG. 1;

FIG. 3 is a detail view of FIG. 1, on an enlarged scale; and

FIG. 4 is a perspective view on an enlarged scale of an article of the type which can be utilized in and affixed by the apparatus according to the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Discussing firstly the apparatus shown in FIG. 1 it is emphasized that it is illustrated in somewhat diagrammatic manner, with certain details such as the base and the like having been omitted as not essential for an understanding of the invention.

The apparatus is generally identified with reference numeral 1 and this reference character P identifies a worktable or plate on which the components of interest are mounted, secured or otherwise affixed.

Reference numeral 2 identifies an upper frame carrying certain of the components but in itself not constituting a part of the invention.

Reference numeral 3 is an upright frame carrying certain of the components but in itself not constituting a part of the invention.
which, as is evident particularly from FIG. 2, is provided with an opening 6 of predetermined outline, here of the configuration illustrated.

Reference may be had here to FIG. 4 where one of the articles which are to be accommodated in the hopper and which are to be inserted into the working station of the apparatus, is illustrated by way of example. The exemplary article 28 in FIG. 4 is here shown as a lock or clasp of the type which is used frequently in women's handbag or shoulder bags and which portion of the handbag is provided with an aperture, and the article 28 is secured on the handbag in such a position that, when the fold-over flap is folded over the clasp 28, the opening in the flap will register with the portion 30 which is turnably carried by the body portion 29 of the article 28. The portion 30 can then pass through the opening in the flap and is then turned through 90 degrees from the illustrated position, thereby extending transversely of the opening in the flap and preventing movement of the latter. Alternatively, of course, the portion 30 may usually extend longitudinally of the body portion 29 and may be turned, when it is desired to close the fold-over flap, to the position illustrated in FIG. 4. This is of no importance for the purposes of the present invention, however, and similarly it is of no importance how the portions 29 and 30 are connected with one another for turning movement. The article 28 is provided in the illustrated embodiment with four prongs 31 which are pushed through the material of the support, which is the handbag, to which the article 29 is affixed and which are then bent over to secure the article to the support.

A discussion of FIG. 4 has been interjected here because it will be evident that the configuration of the opening 6 in the bottom wall 5 of the hopper 4 will depend on the configuration of the article 28, and will accordingly vary therewith.

In any case, the hopper 4 will contain a supply of identical articles, such as the article 28 shown in FIG. 4. According to the invention a rotary member 11 is mounted for rotation about the axis 12 in the interior of the hopper 4, and provided with an agitator member 13 which is here of generally S-shaped outline and may consist of sheet steel or spring steel. As the member 11 rotates about the axis 12, in response to being driven in rotation via the pulleys 14 and 16 and the belts trained around them, with the pulley 16 being connected via a suitable connection 17 with an electromotor 18, the agitator member 13 "scours" the articles 28 which tend to settle at the forward lowest point of the hopper 4, and this agitation causes those of the articles 28 which happen to be in a predetermined position and orientation relative to the opening 6, to pass through the same.

Arranged below the bottom wall 5 and the opening 6 is a sidewalk 7 which is downwardly inclined and has a free lower end portion 10. The sidewalk 7 is the illustrated embodiment is provided with an elongated slot 8 having an open end 9 at the free end 10 of the sidewalk 7. The articles 28 are placed into the hopper 4 in the manner shown in FIG. 4, that is with the portion 30 extending transversely of the portion 29. A suitable intercepting means, diagrammatically illustrated as a bar 12 or the like, is located below the opening 6 and registers with the upper or rear open end of the slot 8. The intercepting means 73, when an article 28 passes through the opening 6 it will straddle the intercepting means 73 in the manner shown in FIG. 3 and will slide under the influence of gravity onto the sidewalk 7 with opposite end portions of the portion 30 overlying the upper surface of the sidewalk 7 at opposite sides of the slot 8. Now the article 28 can only slide downwardly along the sidewalk 7, as illustrated in FIG. 2. Depending upon the speed of rotation of the member 11, which speed may be made adjustable if desired in known manner, or which may be controlled by stopping and starting the rotation of the member 11, for instance by means of a timer or analogous well-known device, a greater or lesser number of articles 28 are passed through the opening 6 and onto the sidewalk 7 within any given time period, for instance per minute. Ordinarily there will be a sidewalk 7 which will probably be filled with a row of the articles 28, as shown in FIG. 3. As shown in FIGS. 1 and 3, the articles 28 advance to the lower end 10 of the sidewalk 7, but cannot quite reach this lower end in free gravity descent. Arranged forwardly and proximal to the lower end is an affixing means, here simply identified as a die 19 which is advantageously of the telescopic type, and which can reciprocate in vertical direction as indicated by the double-headed arrow associated therewith. There is further associated with the apparatus at the working station, that is adjacent the lower end 10 of the sidewalk 7, retardation means comprising a lever 20 pivotable about the axis 22 so as to be movable in the direction of the curved double headed arrow between an operative position shown in FIG. 3, and a withdrawn inoperative position. The lever 20 is provided with a nose or end portion 21 which is so positioned with respect to the open end 9 of the slot 8 when the lever 20 is in the position shown in FIG. 3, that an article 28 sliding down the sidewalk 7 will fall onto the portion 21, straddling the same in the same manner in which this is shown in FIG. 2 with respect to the element 73. When this occurs the die 19 is activated by the operator, driven in suitable manner by compressed air or the like, and moves downwardly toward the table 7. In accordance with the invention the lever 20 and the die 19 are so associated with another in suitable manner that the lever 20 is deflected in response to downward movement of the die 19 from its operative position in FIG. 3 in the direction of the double-headed arrow to its inoperative withdrawn position. However, the die 19 engages the article 28 straddling the portion 21 of the lever 20, so that the portion 21 withdraws from within the space surrounded by the projections 31 (compare FIG. 4) and the die 19 can punch the projections 31 through the material of a handbag or other support to which the member 28 is to be secured. How this is accomplished, and how a counter-die at the other side of the handbag serves to bend over the projections 31 to affix the member 28 to the handbag, are both features which are known to those skilled in the art and forming no part of the present invention.

It is evidently not possible to let the articles 28 descend freely along the sidewalk 7 as soon as they are ejected through the opening 6 of the hopper 4. This would cause jamming of the apparatus because, as the die 19 moves upwardly subsequently to affixing one of the articles 28, two or more of the articles 28 supported on the sidewalk 7 would issue from the open end 9 of the slot 8, and only one of them—namely the leading one—could be accommodated on the portion 21, straddling the same. Any others would jam against one another and against the portion 21.

For this reason I provide an arrangement consisting of the two arms 23 and 24 which are pivotally connected to one another at 26, and of which arm 23 is further pivotally connected to lever 20 at 25. The free end of arm 24 is connected at 27 to the sidewalk 7 and the arrangement is such that when the arm 23 moves to its operative position shown in phantom lines in FIG. 3, the linkage arrangement 23, 24 and particularly the free end portion of the arm 24 which is associated with the sidewalk 7, permits one—namely the leading one—of the articles 28 on the sidewalk 7 to advance along the slot 8 to the free end thereof and to issue from this free end 10 of the portion 21. The portion 28 on the sidewalk 7 are restrained from such movement. Now the die 19 performs the aforementioned operation and the lever 29 withdraws to its withdrawn inoperative position. As the die 19 moves upwardly again and the lever 20 returns to its withdrawn position illustrated in full lines in FIG. 3, the retardation linkage arrangement 23, 24...
again permits the next following article 28—that is the one which is now the leading one of the articles on the slideway 7—to descend so as to come to rest on the portion 21. Because the operation of the die 19 is controlled by the machine operator at the speed which he or she is capable of obtaining, and because the movement of the lever 20 and of the arrangement 23, 24 is governed in automatic response to movements of the die 19, the articles 28 are supplied individually to the working station and at a speed which is commensurate with the speed of operation which the operator is capable of attaining.

To avoid ejection of articles from the upper side of the hopper 4, and operation of the agitating means 11, 13, the hopper 4 is advantageously provided with a lid 4a.

It will be understood that each of the elements described above, or two or more together, may also find a useful application in other types of construction differing from the types described above.

While the invention has been illustrated and described as embodied in an apparatus for affixing small discrete articles to supports, it is not intended to be limited to the details shown, since various modifications and structural changes may be made without departing in any way from the spirit of the present invention.

1. An apparatus for affixing small discrete articles to supports, comprising hopper means having a bottom wall provided with an opening of predetermined outline and adapted to accommodate a plurality of small discrete articles of predetermined configuration; slideway means including a pair of transversely spaced parallel elongated elements extending from below said opening to a location laterally and downwardly spaced from said hopper means, said slideway means having a lower end portion and said elements defining with one another an elongated guide slot configured for receiving and guiding said articles for gravity descent along said slideway means, while maintaining them at a predetermined orientation; affixing means proximal to said lower end portion and operative for affixing the respective leading article to a support; and retarding means associated with said affixing means and operative for retarding articles on said slideway means at a location upwardly spaced from said end portion while the respectively leading article is being affixed by said affixing means, and for permitting advance of the next following article to said affixing means only subsequently thereto.

2. An apparatus as defined in claim 1, wherein said bottom wall and respective upper end portions of said elements are downwardly inclined in substantial parallelism with one another, and wherein said hopper means comprises an agitator means arranged interiorly of said hopper means and operative for agitating the articles therein so that the same pass through said opening with a predetermined orientation when assuming a predetermined position relative thereto in response to such agitation.

3. An apparatus as defined in claim 2, said agitator means comprising a rotary member, and an agitator arm provided on said rotary member.

4. An apparatus as defined in claim 3, wherein said opening is elongated in direction of elongation of said slideway means, and wherein said rotary member is rotatable about an axis normal to the direction of elongation of said opening and at least substantially parallel with the general place of said opening.

5. An apparatus as defined in claim 2, said elements having respective flat upper surfaces located at least substantially in a common plane, and said elongated slot being open at said upper surfaces and having an open end at the lower end of said slideway means, said articles each having a first portion of a first width and a second portion having a predetermined width and extending across the width of said first portion outwards therebeyond, and said slot having a width slightly greater than said first width but shorter than said predetermined length so that said first portions of said articles may be accommodated in said slot below said upper surfaces and said second portions may slide on said upper surfaces laterally of said slot.

6. An apparatus as defined in claim 5, said members being strip-shaped members.

7. An apparatus as defined in claim 5, said affixing means including an affixing member operative for affixing said articles to said supports, and a positioning member operative for positioning the respectively leading article in predetermined relationship to said affixing member preparatory to affixing by the same to a support.

8. An apparatus as defined in claim 7, said affixing member being arranged adjacent said open end of said slot, and said positioning member including a positioning portion movable toward and away from said open end longitudinally of said slot between an operative position in which it receives and positions an article descending under the influence of gravity, along said slideway means and issuing from said open end of said slot, and a withdrawn inoperative position.

9. An apparatus as defined in claim 8, said affixing member comprising a reciprocable die member movable in two opposite directions between an affixing position and a rest position, and said positioning member being associated with said die member for movement to its operative position in automatic response to movement of said die member to affixing position, and vice versa.

10. An apparatus as defined in claim 9, said retarding means comprising a retarding member associated with said positioning member and being operative for retarding the movement of articles along said means to said open end of said slot in automatic response to movement of said affixing member to said inoperative position thereof, and vice versa.

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