This invention relates to an improved fastening device in the nature of a stud or button. An object of the invention is to provide a simple inexpensive fastening device preferably made as a single-piece unit and that is particularly useful for holding together overlapped edges of an article of manufacture such as a garment manufactured from paper or other fragile material.

Another object of the invention is to provide a fastening device which is cut from a strip of material, such as kraft paper, and folded to provide a base and a shank, the shank being easily foldable to provide a toggle or bellows-like action.

A further object of the invention is to provide a foldable stud or button-like member that may be attached to one portion of an article to be fastened or may be glued or taped thereto while being easily insertable through an aperture in another portion of the article and finally easily collapsed by hand pressure to hold the parts of the article in secure engagement.

In the drawing:

FIG. 1 is a plan view of a fastener member as it appears when precut from a strip of material and before folding;
FIG. 2 is a plan view of the fastening device in its normal shape;
FIG. 3 is an isometric view of the stud member shown in FIG. 2;
FIG. 4 is a plan view of a complete installation of the fastener in locked position;
FIG. 5 is a section taken on the line 5—5 of FIG. 4;
FIG. 6 is a plan view of a modified form of complete installation; and
FIG. 7 is a section taken on the line 7—7 of FIG. 6.

There has been a growing industry in the manufacture of articles (preferably of paper material) such as paper coats, restaurant bibs and other similar articles that require the use of some sort of fastening member to secure a closure of the article. In the past, metal snap fasteners have been used; but they have proved generally unsatisfactory because they are expensive and proper holding action has been difficult with the result that the snap fasteners were improperly applied and would tear from the material where used on articles that might be reused.

The present invention is important in this paper clothing and the like industry because it is inexpensive and may be applied easily and cheaply to the article, is reduced to a simple part, it operates easily and may be operated for reuse if desired.

The shape of the device may be varied from that disclosed in the drawing, but it has been found that a simple blank of relatively rigid paper material, such as shown in FIG. 1, may be easily folded to provide a base portion 1. The base portion 1 is illustrated as being formed from two halves and the Shank is formed by two legs 2—2, as best shown in FIG. 3. During the blanking operation, there are also provided a fold 3, at the connected ends of the legs 2—2, intermediate folds 4—4 between the ends of the legs 2—2 and base folds 5—5 at the points where the legs 2—2 join the base 1. These folds 3, 4, and 5, readily permit the forming of the blank into the shape shown in FIG. 3 and provide lines along which the shank may bend for the purposes to be described hereinafter.

While the shank may be of uniform width, it has been found that the folding action will take place more readily when the shank at the joined ends of the legs has a fold line 3 which is shorter than the fold lines 4—4 intermediate the ends of the legs and when the fold lines 5—5 are also shorter than the intermediate fold lines 4—4. Furthermore, the shorter fold line 3 provides a tapered shape to the entering end of the shank so that it may be more easily inserted through an aperture in an article of manufacture.

For the purpose of illustrating one embodiment of the invention, there is shown, in FIGS. 4 and 5, overlapping portions 6 and 7 of an article of manufacture. The base 1 is glued or otherwise secured to the portion 6, as indicated by the heavy lines 8—8 in FIG. 5. The overlapping portion 7 is provided with an aperture 9 shown as in the nature of a slot, as best illustrated in FIG. 4. The aperture 9 may be of any other suitable shape.

When the overlapping portions 6 and 7 of the article of manufacture are to be fastened together, the shank of the fastener is pushed through the aperture 9 during the operation the legs 2—2 may move toward and away from each other. Then pressure may be applied to the outer end of the shank to cause the shank to be collapsed along the fold lines 3, 4, and 5 into the position shown in FIG. 5. It will be noted that the shank takes a sort of flat V-shape with the fold line 3 below the plane of the fold lines 4—4. Thus a toggle action takes place due to the fact that the distance from one intermediate fold line 4 to the other intermediate fold line 4, through the connected ends of the legs, is greater than the total lengths of the legs from the fold lines 4—4 to the fold lines 5—5. This toggle action is important in keeping the shank in collapsed position to keep the overlapping portions 6 and 7 from accidental separation. On the other hand, the connected end portions of the legs may be lifted when desired to force the shank out of toggle action in the closed position to the open position of the shank where the shank legs may then move toward each other so that the shank may be removed from the portion 7 through the aperture 9.

It may be desirable to have an application where it is desired to secure overlapping portions 10 and 11 together without gluing or otherwise permanently attaching the fastener to the overlapping portion 10. In this case, the fastener may be self-retained to the portion 10, by first inserting the shank of the fastener through an aperture 12 (FIG. 7), so that the shank will expand and hold the fastener at one side while the base holds the fastener at the other side. Thereafter, the shank may be passed through an aperture 13 (FIGS. 6 and 7) similar to the aperture 9 in FIG. 4 and collapsed in the same manner as described above and as illustrated in FIGS. 6 and 7.

It should be understood that this invention contemplates the use of the fastening principle already disclosed whether or not the fastener is made as an individual one, made in strip form and attached from an automatic attaching machine, glued to a support by pre-applied glue, or during the attaching operation, or attached in any other manner, as by riveting. It is even contemplated that the fastener stud may be manufactured as an integral part of the article of commerce, it being understood that the main features of the invention is the construction and operation of the fastening device. While the invention has been specifically illustrated by the drawing and described in connection with two types of applications, it should be understood that the invention is best defined by the following claims.

1. A fastening device for use on a part to be fastened having an aperture to receive a portion of the fastening device, said fastening device being formed of a hand pressure foldable material and having a foldable shank pro-
vided with a preformed fold line and adapted to be passed through an aperture in a support and folded along the fold line over the support adjacent to the aperture, said shank being in the form of a pair of legs joined at their outer ends and having a fold line at the joint of the ends and other fold lines intermediate the ends of the legs, and the combined length of the shank from one intermediate fold on one leg to an intermediate fold on to the other leg being greater than the total length of the remaining portions of the legs to provide a toggle action to hold the shank in folded position.

2. A fastening device formed from a single piece of flat paper-like material of relatively stiff texture, said fastening device having a base, said base formed of two pieces, said two pieces spaced from each other, at least two legs normally extending upwardly from said base and joined at their ends spaced from said base along the preformed fold line and each leg having the preformed fold line intermediate its ends, said fold lines permitting axially flattening of said legs towards said base by pressure exerted at the joined end of the legs, the total length of the legs from an intermediate fold line on one leg to the intermediate fold line on another leg being greater than the combined length of the legs from the intermediate fold line on the legs to the base, said legs shaped to provide a shank, the opposite edges of which are tapered outwardly from the joined ends to the intermediate fold lines and then tapered inwardly from the intermediate fold lines toward the base, thereby providing a toggle action for holding the legs in flattened position against accidental return to normal position.

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