May 13, 1941. A. E. NORRIS 2,241,612

ATTACHMENT FOR BAGS

Filed June 25, 1938

Fig. 1.

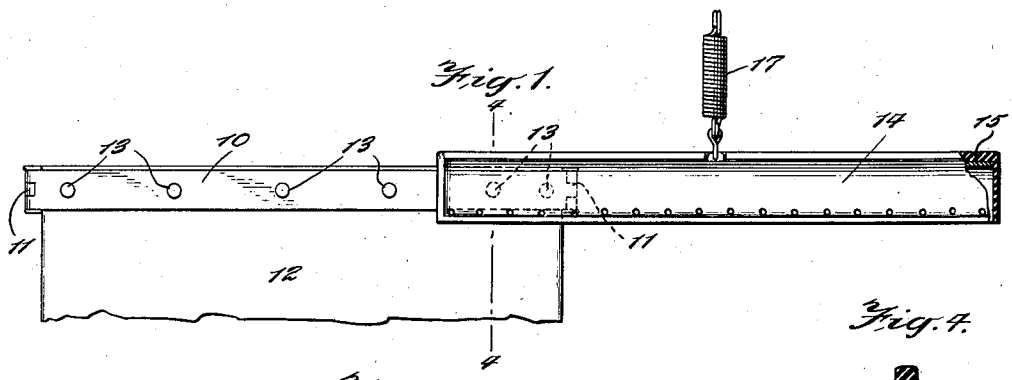


Fig. 2.

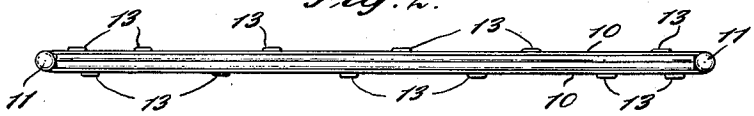


Fig. 3.

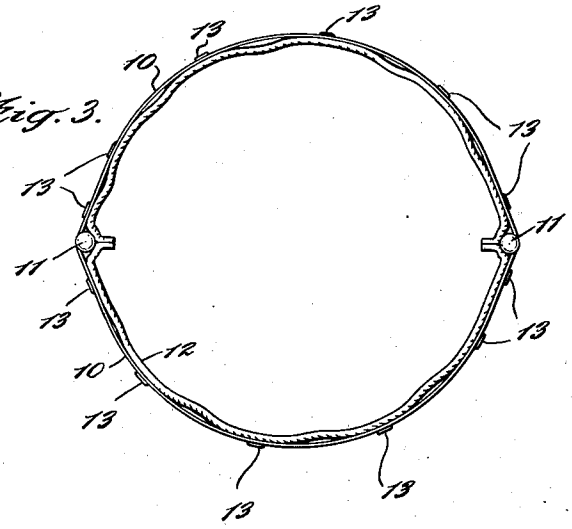


Fig. 4.

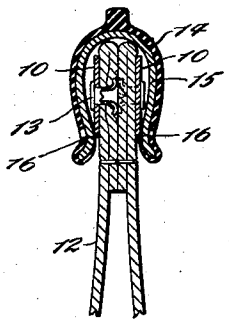


Fig. 5.



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ATTACHMENT FOR BAGS

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Application June 25, 1938, Serial No. 215,752

2 Claims. (Cl. 150—3)

The invention relates to attachments for bags and more particularly to dust bags for suction cleaners, in which my novel construction serves to automatically open or spread one end of the bag to permit the contents thereof, usually dust collected therein, to be readily removed therefrom.

My novel construction of attachment constitutes an improvement over the bag opening device described and illustrated in patent to Holmes, 1,513,395, dated October 28, 1924, in which patent there is described a resilient device comprising complemental members tending to spread the device into a symmetrical open position to permit the removal of the contents of a bag, such as a vacuum cleaner dust bag.

The bag attachment of the type disclosed in the Holmes patent is characterized by a comparatively short span of life of the bag opening structure due primarily to the fact that the complemental members constituted of the springs are completely hemmed in, and surrounded by, the fabric material constituting the mouth of the bag. Since the fabric surface must be smooth when the mouth of the bag is closed to enable the clamp to pass smoothly thereover and tightly engage both sides of the mouth to insure a dustproof closure, the fabric must fit tightly over the springs when the bag mouth is in closed condition; hence, the fabric being external to the springs, it restricts the degree of opening of such springs when the clamp is removed, and attempts to force the springs open to a greater extent place a strain on the fabric. Moreover, it has been found in practice that in this type of structure, with the use of a clamp which is adapted to slidably encompass the spring elements and the fabric material enclosing the same, the fabric soon becomes worn and frayed substantially throughout the portions thereof in contact with the inner faces of the clamp element. Furthermore, in such prior construction of such an attachment, the application of the clamp to the opening is rather difficult because of the great amount of friction produced between the fabric and the inner face of the clamp each time the clamp is applied to, or removed from, the attachment.

In accordance with my improved construction, I overcome these disadvantages by constructing the attachment with the spring leaf elements disposed and secured on the outside of the fabric material of the bag, so as to procure the greater facility in applying the clamp to the bag opening which can be attained by the sliding movement of the metal portion of such clamp over the metal surfaces of the spring elements. I thus eliminate the wear upon the fabric and at the same time secure a construction in which the sliding movement of the clamp, both to encompass the two spring leaf elements and to release them, is greatly facilitated.

My novel construction of bag attachment is further characterized by the capacity of the spring leaf elements to be expanded to substantially a circular disposition thereof, without strain on the fabric rather than to the limited degree of the expansion thereof to an opening which is substantially oval, as in the structure of the Holmes patent hereinabove referred to. This novel and distinctly advantageous effect, facilitating the removal of the contents of the bag, is attained by a construction in which the expansion of the spring leaf elements is in no way restricted by the fabric material, there being no restraining effect by the hemming enclosing the springs, upon their expansion to a full circular position. In my improved construction, the bag fabric is riveted to the spring leaf members in substantially closed position and interiorly of the springs, so that when the springs expand, the fabric material will lie upon a shorter arc rather than along a longer arc (as in Holmes), and instead of being stretched will actually be looser than in the closed condition of the bag, thus permitting the spring members to be expanded substantially to a condition in which they form a complete circle without any strain on the fabric.

A particular embodiment of my invention is illustrated in the accompanying drawing, in which Fig. 1 is an elevation of the upper portion of a bag, with my novel structure applied thereto; Fig. 2 is a plan view of the bag opening with the complemental members, constituting the spring leaf elements, in compressed condition ready to receive the clamp; Fig. 3 is a plan view of the bag opening in its fully open condition; Fig. 4 is a cross-section on an enlarged scale on the line 4—4 of Fig. 1; and Fig. 5 is an elevation of one form of vacuum cleaner dust bag to which my invention may be applied.

Referring more particularly to the drawing, in which similar reference characters identify similar parts in the several views, my novel attachment comprises an expansible member consisting of two flat springs 10 pivotally connected together at their opposite ends, preferably by means of hinges 11. The tension of the springs 10 is such that the expansible member normally tends to assume the position shown in Fig. 3

in which the springs are spread apart. The expansible member is applied to the mouth end of the bag 12, which may be of any conventional construction, by securing the flat spring elements of such expansible member to the fabric material of the bag by means of a plurality of rivets 13 passing through the springs and through the fabric material of the bag, and in accordance with the invention, the flat springs are positioned exteriorly of the fabric, that is, along the outer peripheral surface of the bag opening.

In Fig. 2, the flat springs 10 are shown in their normal closed position in which the fabric of the bag extends substantially in flat condition throughout the length of said flat springs, i. e. without any bulging of the fabric material between the riveted connections. When, however, the flat springs are permitted to expand, they assume a shape and form substantially that shown in Fig. 3, thereby permitting the bag opening to assume a substantially circular form. In the open condition of the bag, as can be seen in Fig. 3, the fabric extends along an arc whose length is less than the length of the springs in the closed condition, so that, instead of being tensioned, as heretofore, the bag fabric becomes looser and curls slightly, as indicated in somewhat exaggerated fashion in Fig. 3.

The end of the bag to which the expansible member constituted of the flat springs 10 is secured is maintained in its normal closed position, shown in Fig. 2, by means of the customary clamp 14, preferably constituted of rubber and having a metal lining, the clamp being slidably engaged over the end of the bag as indicated in Figs. 1 and 4 serving to clamp the springs 10 together in the position shown best in Fig. 4, in which the end of the bag is efficiently and completely closed.

The clamp 14 is provided with the metallic lining 15 which in the operation of slidably engaging the clamp over the end of the bag is in sliding line contact with the flat metal springs 10 as shown at 16 in Fig. 4. The form of the clamp 14 is arcuate in cross-section, so that ample space is provided between the metal springs 10 and the metallic lining of the clamp to permit the clamp to be slidably moved over the end of the bag without contact of the metallic lining of the clamp with any of the rivets 13. These rivets, as can be seen from Fig. 4, are headed, and extend beyond the exposed spring surfaces, and will prevent disengagement of the clamp from the springs in a direction transverse to the length of the springs, the rivets being spaced sufficiently from the bottom edges of the springs to enable the clamp to engage said springs below the rivet heads without riding on such heads.

The clamp 14 may be provided with the customary spring 17 whereby the bag is maintained in place upon the suction cleaner. When it is desired to empty the bag, it is disconnected from the suction cleaner in the well known manner, and the clamp 14 is slidably withdrawn, as indicated in Fig. 1, whereby its restraining effect upon the expansible member consisting of the two flat springs is removed. As soon as the clamp has been fully withdrawn from the bag, the end of the latter, because of the inherent expansibility of the springs 10, will be automatically opened or spread even to the substantially circular form or position shown in Fig. 3 where the springs are correspondingly constituted. The action of the springs 10 will maintain this end of the bag in such open condition and thereby permit the contents thereof to be readily emptied and completely removed from the bag.

To again close the bag, the springs 10 are simply compressed toward each other to permit the clamp 14 to be again slidably placed over the expansible member to maintain the springs constituting the same in the condition shown in Figs. 2 and 4.

It will be noted that by my novel attachment, by reason of the disposition of the flat springs 10 along the outer periphery of the bag opening, I greatly facilitate the application of the clamp member 14 to the expansible member as I provide, by this construction, a sliding movement of metal against metal, rather than, as in the prior construction hereinabove referred to and described in the Holmes patent, of metal or rubber against a fabric. In this manner, the inordinate amount of friction caused by the repeated sliding movement of the clamp 14 over the fabric of the bag is eliminated, thereby avoiding the fraying and eventual disintegration of the fabric covering constituting the hemmed end of the bag.

Furthermore, as hereinabove explained, by securing the flat springs 10 to the outer periphery of the fabric of the bag, in the position at the end of the bag in which the two portions thereof are parallel, and in contact, as shown in Fig. 2, I provide a construction in which the fabric at the mouth of the bag is placed under no strain whatsoever, as the springs are opened to greater and greater extents, the fabric material permitting the expansible member to open easily to any desired form, including the substantially circular form. The placement of the springs externally of the fabric has the further advantage that it permits more ready and complete removal of the contents of the bag, as there is no possibility of any of the contents of the bag, such as fine dust, being trapped, when the bag is inverted to effect the emptying thereof, at the two apices or hinges of the springs, as is the case, for instance, in the construction shown in the Holmes patent.

While the invention is primarily intended for use in bags comprising a part of the well known suction cleaners, it obviously will be useful in connection with bags of other types in which it is desired, at periodic times, to maintain an end thereof in an open, spread condition. The attachment is of particular usefulness in connection with suction cleaner bags, which have always been difficult to empty and in which the removal of the dirt and other contents of the bag is always a messy and dirty operation. With the present attachment, the emptying of the bag becomes the simplest kind of an operation, easily accomplished without the soiling of the person emptying the bag. Furthermore, because of the facility with which the clamp may be applied to the expansible member, the operation is one which will take much less time and will appreciably extend the life of the bag by reason of the elimination of the destructive effect of repeated frictional movement of the clamp over the surface of the bag fabric.

Various changes in the specific form shown and described may be made within the scope of the claims without departing from the spirit of my invention.

I claim:

1. The combination of a bag of pliable fabric, a resilient device comprising metallic members having an inherent resiliency in its entirety tend-

ing to spread said device into the open condition, said device being secured to said bag at the mouth thereof and being disposed externally of the fabric portion so as to provide the outermost surface of said mouth, and means engaging the metallic members directly upon their exposed surfaces for clamping said members to each other in straight line relation with the bag fabric therebetween.

2. The combination of a fabric bag for suction cleaners having a mouth through which the collected refuse is removed, a pair of flat, metallic springs hinged together at opposed ends and biased to open condition, said springs being secured externally of the fabric constituting the bag mouth by a plurality of rivets spaced along the length of said springs, the rivets on one of said springs being staggered relative to the rivets on the other, and clamp means of transversely curved channel cross-section adapted to be slidably engaged over the closed mouth of the bag in frictional contact with the exposed surfaces of the metallic springs to maintain said springs in alignment and thereby to hold the end of the bag closed, said rivets being headed and being spaced sufficiently from the bottom edges of the springs to enable the clamp to engage said springs below the rivet heads, whereby the latter prevent disengagement of the clamp from the springs in a direction transverse to the length of the springs.

ALFRED E. NORRIS.