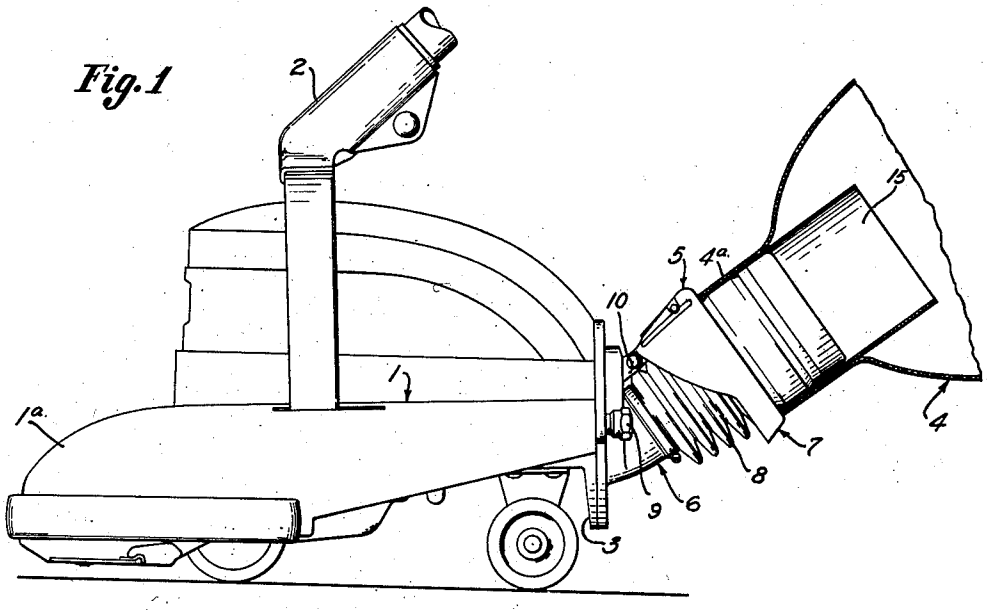
July 22, 1941. H. B. WHITE 2,250,285

BAG ATTACHING FIXTURE FOR SUCTION CLEANERS

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Fig. 1



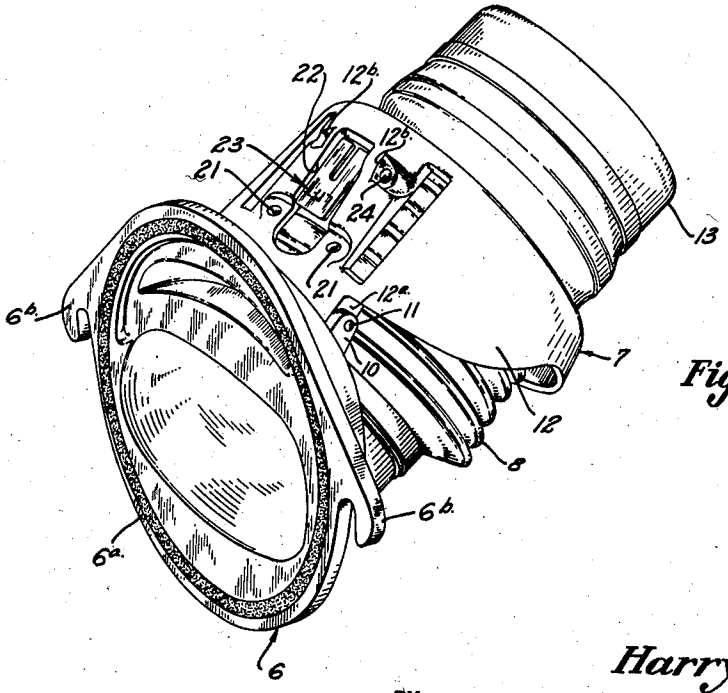


Fig. 2

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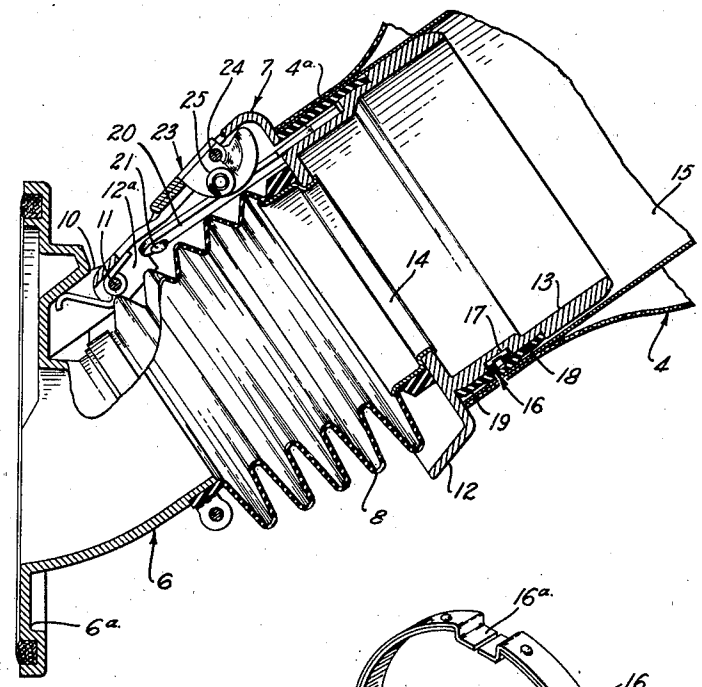
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BAG ATTACHING FIXTURE FOR SUCTION CLEANERS

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Fig. 3



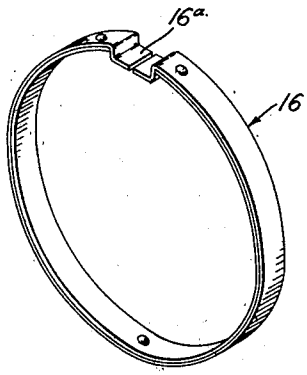


Fig. 5

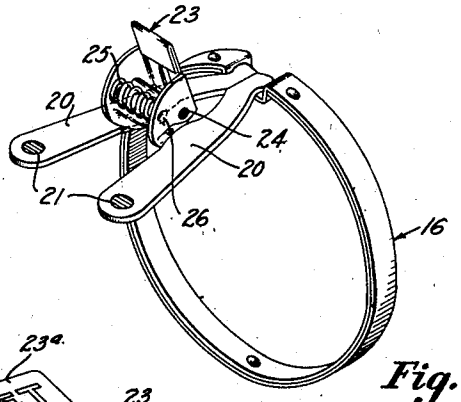


Fig. 4

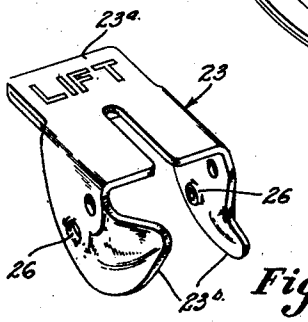


Fig. 6

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UNITED STATES PATENT OFFICE

2,250,285

BAG ATTACHING FIXTURE FOR SUCTION CLEANERS

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Application July 8, 1939, Serial No. 283,326

4 Claims. (Cl. 285—171)

This invention relates to improvements in bag attaching fixtures for suction cleaners and more particularly to an improved device for quickly and conveniently securing the lower end of a dirt bag to the exhaust outlet connection of a suction cleaner.

Heretofore, it has been the common practice to fit the inlet end of a dirt bag onto a metal or other rigid ring by suitable clamping means and to attach the ring directly to the outlet connection by means of a pair of quickly releasable clamping bolts so that the bag can be readily removed from time to time for the purpose of emptying its contents.

Such a novel arrangement is ordinarily associated with a dirt bag made of a porous fabric and capable of use over a considerable period of time. However, with the development of the paper bag to replace the more expensive cloth bag has made it necessary to devise a suitable fitting or mounting so that the user can quickly replace one bag with another when one wears out or, as is now being considered for practical use, an inexpensive bag to be removed and disposed of with its contents after one filling.

Therefore, the object of the present invention is to provide an improved mounting for the inlet end of a bag preferably made of a porous paper and including a novel clamping arrangement whereby the mouth of the bag is held firmly and against any possible leakage during the period of filling.

A preferred embodiment of the invention is disclosed in the accompanying drawings, in which:

Figure 1 is a general view of a suction cleaner in side elevation showing the lower portion of the bag in section;

Figure 2 is an enlarged perspective view of the bag attaching fitting as it appears when removed from the cleaner;

Figure 3 is a detail view in vertical section through the attaching fitting showing the mouth portion of the bag secured thereto;

Figure 4 is an enlarged view in perspective of the expansible clamping ring and toggle lever assembly used in the fitting;

Figure 5 is a perspective view of the expansion ring as it appears when removed from the assembly; and

Figure 6 is a perspective view of the operating lever for the expansion ring assembly.

The cleaner illustrated in Figure 1 is typical of any standard cleaner and therefore need not be described in detail.

The wheeled casing 1 is provided with a nozzle 1*a* at its forward end which communicates with a fan chamber in which a motor-driven fan creates the suction which gives the device its cleaning ability as it is maneuvered over the carpet surface by the handle 2 in the hand of the operator. At the rear end of the casing 1 is a flanged outlet connection 3 to which the dirt-laden air from the fan chamber is exhausted into the dirt bag 4 preferably consisting of an elongated bag-shaped container made of a relatively tough porous paper, having a neck portion 4*a* of considerably reduced diameter at the lower end adapted to fit onto a sleeve-like seat at the outer end portion of the attaching fitting 5 located intermediate the outlet connection 3 of the cleaner and the bag 4.

This fitting consists primarily of two hinge-connected tubular members 6 and 7, connected by an expansible bellows member 8. The member 6 has the form of an elbow with a bend of approximately 45 degrees and at its forward end is a flanged portion 6*a* adapted to bear against the outlet connection 3 of the cleaner casing 1 and to have detachable connection therewith through the medium of a pair of downwardly projecting ears 6*b*, 6*b* on either side thereof, said ears engaging a pair of clamping bolts 9, 9 anchored in the flanged outlet connection 3.

Projecting rearwardly and upwardly from the rear face of the flanged portion 6*a* of the member 6 is a pair of ears 10, 10 supporting a hinge pin 11 on which is pivotally mounted the outer tubular member 7 of the fitting, consisting primarily of a collar portion 12 preferably of cast metal and forming a partial housing for the connecting bellows member 8, and a sleeve 13 forming a seat for the neck portion 4*a* of the bag 4. The collar portion 12 of the outer hinged member 7 of the fitting increases in width as it approaches its upper half section and along its edge are formed a pair of marginal ears 12*a*, 12*a* engaging the hinge pin 11 just inside of the supporting ears 10, 10.

The sleeve 13 projects outwardly beyond the collar member 7 with an abrupt shoulder formed at its base, as clearly shown in Figure 3.

The bellows member 8 connecting the two hinged sections 6 and 7 of the fitting is preferably formed of rubber or like flexible composition fashioned into a corrugated contour which permits of its axial expansion and contraction, as the outer hinged section of the fitting swings with the bag 4 and the handle 2 to which the outer end of the bag is attached. One end of the bellows

member 8 is clamped to the end of the elbow member 6 and its other end is suitably seated around a thin metal ring 14 fitted into a large aperture at the base of the sleeve portion 13 of the movable member 7.

As heretofore stated, the neck portion 4a of the bag 4 is fashioned to slide onto and fit snugly around the sleeve 13 at the outer end of the attaching fitting, and to this end the neck of the bag is preferably reinforced by a cylindrical liner 15 preferably of some suitable fibrous material, but relatively stiffer and stronger than the bag material. Thus, the reinforced neck portion of the bag is readily presented to and slipped onto the outer sleeve portion 13 of the fitting and, with no portion of the fitting surrounding the same, it follows that in order to fasten the bag in place, either the sleeve 13 or an annular member carried thereby must be internally expanded.

By preference, an internally expansible ring 16 is employed and this ring surrounds the sleeve 13 adjacent its base and fits within an annular channel 17 with its outer face slightly below the annular surface of the sleeve. On either side of the channel, the face of the sleeve is recessed to form a considerably wider but shallower channel 18, the latter being occupied by a thin sleeve 19 of a suitable resilient material, preferably sheet rubber. Thus, the expansion ring 17 is enclosed and concealed beneath by the wider band 19 of rubber which normally lies flush with the surface and extends approximately throughout the inner one-half section of the surface of the sleeve 13.

It is now apparent that by expanding the ring 16 after the reinforced neck portion of the bag 4 has been fitted onto the sleeve 13, a firm connection is established through the combined displacement and frictional gripping action of the expansible rubber collar 19, and it only remains to provide a practical actuating mechanism for internally expanding the clamping ring.

As clearly shown in Figure 5 the expanding ring 16 is preferably made up of two laminations or thin rings fitted one within the other and riveted together, the inner ring being somewhat shorter circumferentially and the outer ring having its meeting ends bent inwardly in L-shape to form a shallow outwardly-facing recess 16a.

In the assembly of the fitting, the recessed split in the expansion ring 16 is positioned at the top of the sleeve and within the recess 16a seats the forward ends of a pair of toggle levers 20, 20 having a pivotal connection at their rear ends on the underside of the collar 12 at 21, 21 and on either side of a transversely extending slot 22 formed in its top section. As clearly shown in Figure 4, these toggle levers are normally arranged in V-shape with their meeting ends lying within the recess 16a in the expansion ring 16 and between these levers and substantially midway their ends is a pivoted cam lever 23, the same consisting of an operating lever portion 23a and a pair of ears 23b, 23b bent downwardly along the outer edges and at right angles to the portion 23a to form a pair of spaced cams. A hinge pin 24 passes through the ears 23b, 23b just below the operating lever portion 23a, said hinge pin being supported at each end by ears 12b, 12b struck inwardly from the collar 12 on either side of the slot 22 and adjacent its forward end. Thus, the cam lever 23 occupies the slot 22 with its handle portion directed toward its outer end and the two cams 23b projecting downwardly between the two toggle levers 20, 20 and in contact with their inner edges.

As clearly shown in Figure 6, the end portions of the ears 23b, 23b are suitably fashioned to coact with the inner edges of the toggle levers 20, 20 to impart a cam action to the latter and in the nature of a spreading apart of their forward ends as the cam operating lever 23 is swung downwardly into a position flush with the slot 22 and conversely, permitting the toggle levers to come together at their forward ends under the contractive effort of the expansion ring 16 when the operating lever 23 is rocked upwardly into a vertical position, as shown in Figure 4. And finally, in order to maintain the cams 23b, 23b in spaced relation and yet give them some degree of resiliency, a compression spring 25 is inserted transversely between them and is preferably supported by extrusions 26 (Figures 4 and 6).

Obviously, various other devices might be used for controlling the internally expansive action of the ring 16 and acting either directly to clamp the reinforced mouth portion of the bag upon the sleeve portion 13 of the fixture or, indirectly through the annular sheet rubber facing surrounding the ring. In any case, it would be a clamping action exerted between the relatively non-expansible neck portion of a bag and a manually actuated internally expansible member.

Moreover, other arrangements might also be adopted for accomplishing the same ends, as for instance by introducing expansible sections within the circumference of an otherwise rigid sleeve onto which the end of the bag is seated or, by making the entire sleeve flexibly contractible and expansible. Accordingly, it is not desired that the scope of this invention shall be limited to the specific disclosure herein described, except insofar as the invention is set forth in the appended claims.

I claim:

1. A bag attaching fitting for suction cleaners, comprising a tubular portion communicating with the exhaust outlet of the cleaner and adapted to have the restricted inlet end of a dirt bag fitted snugly onto the end thereof, an annularly expansible ring mounted within an annular groove in the outer surface of said tubular portion of the fitting, a relatively thin wide band of resilient material applied over said ring and normally flush with the surface of said tubular end portion, and lever-actuated cam mechanism operatively connected with said ring for effecting the expansion and contraction thereof for the attachment and removal of said bag.

2. A bag attaching fitting for suction cleaners, comprising a tubular sleeve portion communicating with the exhaust outlet of the cleaner and adapted to have the restricted inlet end portion of a dirt bag fitted snugly thereon, an annularly expansible ring mounted within an annular groove surrounding said sleeve portion adjacent its base, a band of sheet rubber substantially wider than and surrounding said expansible ring and lying substantially flush with the surface of said tubular end portion within shallow recesses on either side of said expansible ring retaining groove, and lever-actuated cam mechanism for expanding and contracting said ring.

3. A bag attaching fitting for suction cleaners, comprising a tubular member communicating with the suction system of the cleaner, expansible means embracing the exterior of said tubular member for the reception thereover of one end of a cleaner dirt bag, said expansible means being limited to substantially radial movement with respect to said tubular member, and means

for expanding said expansible means radially outwardly from said tubular member into engagement with the wall of said dirt bag, said dirt bag wall limiting the expansion of said expansible means for attaching the bag to said tubular member.

4. A bag attaching fitting for suction cleaners, comprising a tubular member communicating with the suction system of the cleaner, expansible means embracing the exterior of said tubular member for the reception thereover of one end of a cleaner dirt bag, said expansible means being limited to substantially radial movement with respect to said tubular member, and manually operated means movably mounted on said tubular member and having cam means engaging said expansible means for expanding said expansible means radially outwardly from said tubular member into engagement with the wall of said dirt bag, said dirt bag wall limiting the expansion of said expansible means for attaching the bag to said tubular member.

HARRY B. WHITE.