

[54] **DISPOSABLE, VACUUM CLEANER BAG**
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 [22] Filed: **July 22, 1971**
 [21] Appl. No.: **165,320**

Related U.S. Application Data

[63] Continuation of Ser. No. 879,340, Nov. 24, 1969,
 abandoned.
 [52] U.S. Cl. **55/370**, 15/327 E, 24/205.13 C,
 55/381, 55/DIG. 2, 55/DIG. 3, 229/62
 [51] Int. Cl. **B01d 46/02**
 [58] Field of Search..... 55/361, 370, 372,
 55/376, DIG. 2, DIG. 3, 381; 15/327 E;
 24/205.13 C, 205.16 C

References Cited

UNITED STATES PATENTS

2,553,424	5/1951	Osborn	55/372 X
3,191,365	6/1965	Feeley.....	55/369
2,901,803	9/1959	Porepp.....	24/205.13 C X
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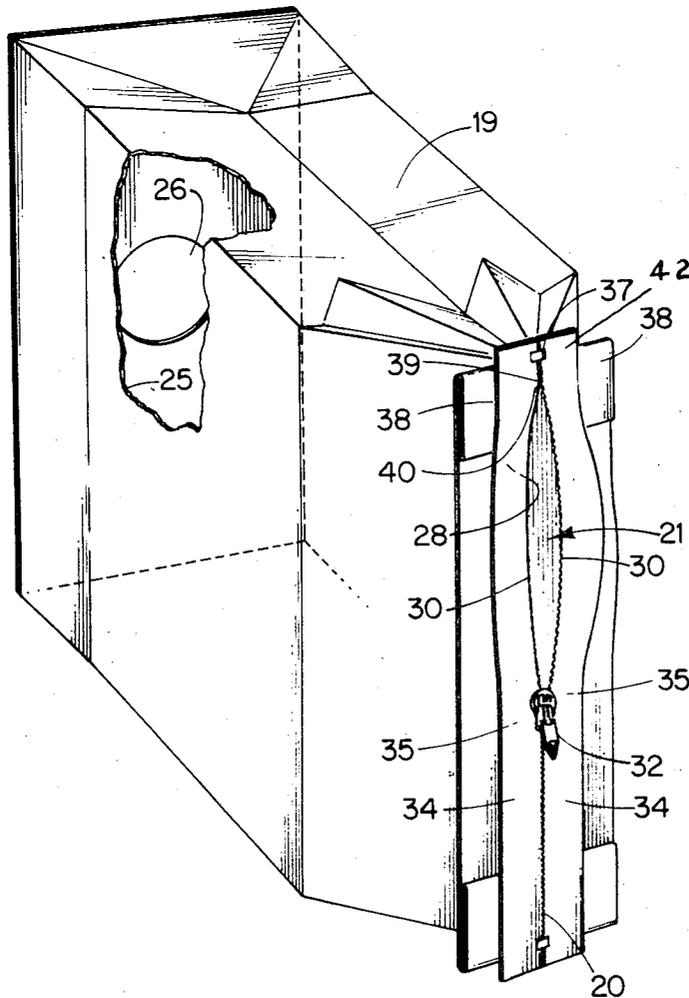
2,833,372	5/1958	Lappin et al.....	55/376 X
2,241,601	5/1941	Kessler.....	55/370 X
2,932,146	4/1960	Campbell.....	55/361 X
3,203,551	8/1965	Van Loan, Jr.....	55/369 X
3,083,396	4/1963	Senne et al.....	15/327

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[57] **ABSTRACT**

A novel and inexpensive, dust-collector bag of disposable, low cost, paper-like material supported within the chamber of the shell of vacuum cleaning apparatus, the bag having one end slidably removable from the shell air inlet port and having a low cost, disposable slide-fastener, preferably of the twin-helix type constructed of plastic, adhesively sealed transversely in an opposite end opening in the bag to provide means to quickly remove the bag from the shell and to empty out the contents and thereby allow easy and continued reuse of the bag, rather than one use and discard thereof.

2 Claims, 3 Drawing Figures



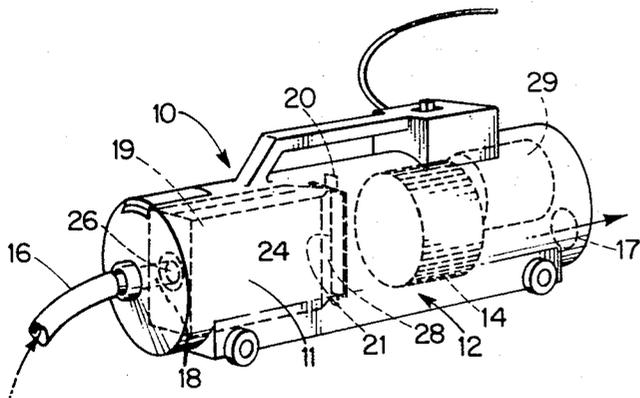


Fig. 1.

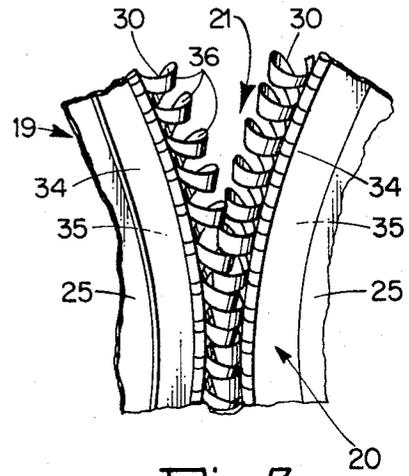


Fig. 3.

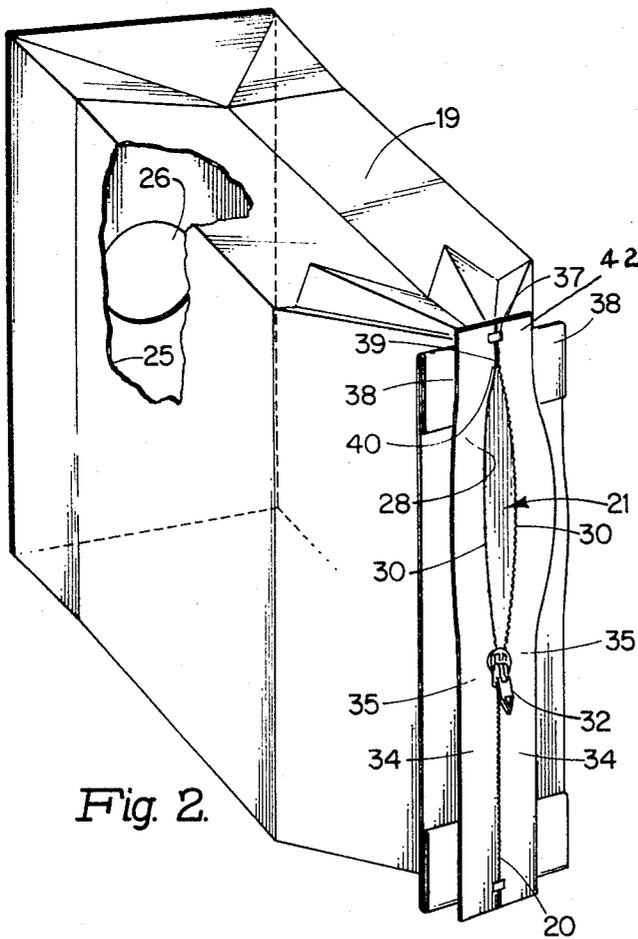


Fig. 2.

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DISPOSABLE, VACUUM CLEANER BAG

This application is a continuation of my application Ser. No. 879,340, filed Nov. 24, 1969, now abandoned.

BACKGROUND OF THE INVENTION**A. Field of the Invention**

This invention relates to a novel construction of disposable air-permeable bags such as are used in vacuum cleaners and the like.

B. Prior Art

In recent years, vacuum cleaners have been developed which, contrary to the older upright vacuum cleaners, use internal, disposable, bag means to collect the dirt picked up by the suction system. These internally-located disposable bags are generally subjected to higher-velocity exhaust air streams than the older bags used on the upright machines, and, as a consequence of such higher-velocity air streams, it has been necessary to increase the porosity, the dust-retentivity and the plugging-resistance characteristics of such bags. Special papers (e.g. such as that described in the U.S. Pat. No. 2,928,765 to Kurjan, wherein a more porous layer and a less porous layer of fibre are formed with an intermingling interface into a single paper) have been developed to help meet the requirements of the high-velocity vacuum-cleaner applications. Although such papers have been generally successful with respect to dirt filtering capabilities, the necessity of using such papers has gradually increased the cost of the so-called disposable vacuum cleaner bag to the point that its disposable characteristic is a major cost factor in operation of the vacuum-cleaning equipment. These improvements in operating characteristics have resulted in a bag which, although sold as disposable, has the potential to be used several times before it becomes plugged to the point that further use is disadvantageous.

In this invention, a clear distinction is drawn between the original equipment, relatively expensive, woven-fabric dust bags, mounted exteriorly of the conventional vacuum cleaner of the upright type, such as made for years by Hoover, Hamilton-Beach and others and the Electrolux type cleaner in which a disposable bag, usually of paper, is supported within the cleaner shell and is intended to be discarded when the bag is full.

It has heretofore been proposed to install a slide fastener, usually axially of such woven-fabric, non-disposable bags, as in U.S. patents to Darst, U.S. Pat. No. 1,801,193, Norton, U.S. Pat. No. 1,876,338, Page, U.S. Pat. No. 1,894,884, and Hutchinson U.S. Pat. No. 1,914,370, the fasteners of these patents varying in length and in relative axial location, but all being exterior fabric bags with spring clamps at the end. A similar bag is disclosed in U.S. Pat. No. 2,241,601 to Kessler, except that the closure and its slide fastener are near the entrance of the bag and extend transversely of the bag in an arc.

Prior art bags which are within the cleaner shell and made of disposable material are exemplified by U.S. Pat. No. 3,191,365, to Feely, in which a spring clamp closes the end of the bag, as in Farnsworth, U.S. Pat. No. 1,357,390, the clamp not being disposable, but intended to be retained when the bag is discarded.

SUMMARY OF THE INVENTION

In this invention, an interior dust-collector bag, of

throw-away, porous material, not only has the usual opening at one end by which it is connected to the vacuum, but also has a second opening, preferably extending transversely along the opposite end of the bag, the second opening having an inexpensive, throw-away, slide fastener adhesively fixed along the edges of the opening to form a sift-proof, easy opening, closure. Unlike the spring clamp device of the above mentioned Feeley patent, in which a housewife might be unaware that dirt, or lint, was causing a leak of air, the plastic, low-cost slide fastener of this invention will stick when dirty, thus warning that it should be wiped clean for perfect sealing action.

The principal object of the invention is to provide a throw-away vacuum cleaner bag with a built-in, throw-away zipper across the far end of the bag, so that the disposable bag can be easily emptied and reused until it has lost its ability to filter out dust.

Another object of the invention is to provide such a bag using a closure means which, if fouled by dirt, comprises a self-warning feature to alert the user to the fouling.

A further object of the invention is to provide a less expensive, semi-disposable, vacuum cleaner bag than has been suggested heretofore.

Other objects of the invention will be obvious to those skilled in the art on reading the instant invention.

The above objects have been substantially achieved by incorporating a slide fastener into what would normally be considered the bottom section of a collector bag, the bag preferably being of plug-resistant paper material. Use of a paper of high resistance to fouling by dirt is essential, or the bag would be useless for reuse.

Those skilled in the art would probably believe that it was uneconomical and impractical to attach an expensive slide fastener to a cheap, disposable paper bag. However, I have discovered that such disposable paper bags may cost as much as 25 cents each on certain types of vacuum cleaners, while slide fasteners can be obtained in quantity in the garment trade for as little as 2 cents apiece for a suitable length. I have also discovered that while sewing the slide fasteners in place would seem most practical, the glueing, or other adhesive attachment of the fastener to the bag creates a sift proof sealed joint, or seam, which is most advantageous.

The slide fastener can be a zipper of the type often used in ladies clothing, for example, that type of slide fastener which comprises two ribbed and mated flexible strips locked into one another by a sliding assembly mounted on the strips, mating-helix type zippers or the like. Zippers comprising two mating helices are especially advantageous because of the economics of producing the same and their resistance to fouling. The latter factor is apparently assignable to the open loop construction forming cavities into which small pieces of dirt can be brushed by the action of the zipper during its closing. Dirt in these cavities neither interferes with the opening of the zipper nor with a sufficiently tight closing of the zipper to prevent dirt leakage there-through.

Moreover, it is desirable to form the slide fastener from a relatively soft material, such as plastic-like nylon, polypropylene, poly (terephthalate) or the like rather than of harder metallic materials. The softer materials will allow hard pieces of grit to be embedded therein rather than scouring the surface thereof in such

a way as to gradually erode the seal formed by the slide fastener.

The slide fastener should be advantageously positioned in the bag in the interior face at the far end, against which the initial dirt particles entering the bag are deposited. This positioning assures that the first dirt will be utilized as a kind of a filter media which will provide an additional protection against leakage of dirt through the filter bag at any point near the slide fastener.

The invention accordingly comprises an article of manufacture possessing the features, properties, and the relation of elements which will be exemplified in the article hereinafter described and the scope of the invention will be indicated in the claims.

ILLUSTRATIVE EXAMPLE OF THE INVENTION

In the drawings:

FIG. 1 is a schematic view of a vacuum cleaning apparatus showing the proper positioning of collector bag with slide fastener therein.

FIG. 2 is a perspective view of a collector bag constructed according to the invention.

FIG. 3 is an enlarged view of a particularly advantageous slide fastener useful in the invention.

Referring to FIG. 1, it is seen that vacuum cleaner 10 comprises a bag supporting shell 12 for holding apparatus which includes a blower 14 for drawing air through hose 16 into and through dust collector bag 19, received and enclosed in chamber 11, thence as a cooling stream past the blower and out of the exhaust port or outlet 17.

Slide fastener 20, forming means to open and shut a relatively larger dirt, or dust, outlet 21 is so positioned in bag 19 that light dirt 24, initially carried into the low cost, disposable, throw-away porous paper bag body 25 of bag 19 through a smaller air inlet port 26, is carried against that face 28 of bag 19 in which slide fastener 20 is positioned and permanently attached. This is achieved by having the slide fastener 20 at the downstream side of bag 19, i.e., adjacent blower 14.

Referring to FIG. 2, it is seen that bag 19 contains low cost, disposable, throw away, slide fastener means 20 comprised of twin helices 30 which are pushed together and pulled apart by sliding member 32 to form the relatively large dust outlet 21. The helices can be attached directly to the bag by adhesive, but more desirably are mounted in cloth strips 34 which are attached to the bag 19 by the adhesive layer 35 indicated in FIG. 3.

FIG. 3 shows an enlarged view of a plastic twin-helix

slide fastener of FIG. 2. Helices 30 are seen to fit rightly and accurately to present a good barrier to the passage of dust therethrough. Moreover, the plastic surfaces have a self-lubricating character that is beneficial in the indicated vacuum-cleaning application. Another particular advantage of such a closure over those known in the prior art is the fact that a housewife will be alerted to gross contamination which is likely to interfere with operation of the apparatus by a sticking action. When so alerted, the housewife can easily remove the dirt causing the sticking action, thereby avoiding any serious dust leakage from the bag after it has been inserted in the machine.

As shown in FIG. 2, the slide fastener tapes 34 are preferably slightly longer than the length of the dirt outlet 21, so that the end clip 37 projects beyond the bag at one side and the slide 32 projects beyond the bag at the other side. This permits the adhesive layer 35 to seal the portion of the fastener inside the clip 37 to the adjacent folds 38 of the bag, including the teeth 39 of the fastener, as shown at 40, to prevent leakage of air therearound. The projecting tab 42, which carries the slide 32 when closed, is also so sealed and serves as a convenient grip tab for grasping and manipulating the slide.

I claim:

1. A disposable vacuum cleaner bag for use within the shell of a vacuum cleaner, said bag comprising:
 - a body of low cost, throw-away, porous material having one end with a relatively small air inlet port therein adapted for removable attachment on the inlet port of said shell, having porous side walls free of access openings, and having an enlarged dirt outlet of predetermined length at the other end thereof for emptying out the contents of said bag;
 - low cost, disposable, twin helix, slide fasteners of relatively soft plastic material affixed to cloth tapes, said tapes being of predetermined length greater than the length of said dirt outlet and extending along the edges thereof; and
 - a layer of adhesive adhering said tapes to said bag to form a sift-proof sealed joint therewith;
 - said tapes projecting at each opposite end thereof beyond said bag to form finger grip tabs.
2. A disposable bag as specified in claim 1, wherein:
 - the edges of said bag on each side of said dirt outlet of predetermined length are formed by folds in the material of said bag and said tapes are adhered by said layer of adhesive to said folds.

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