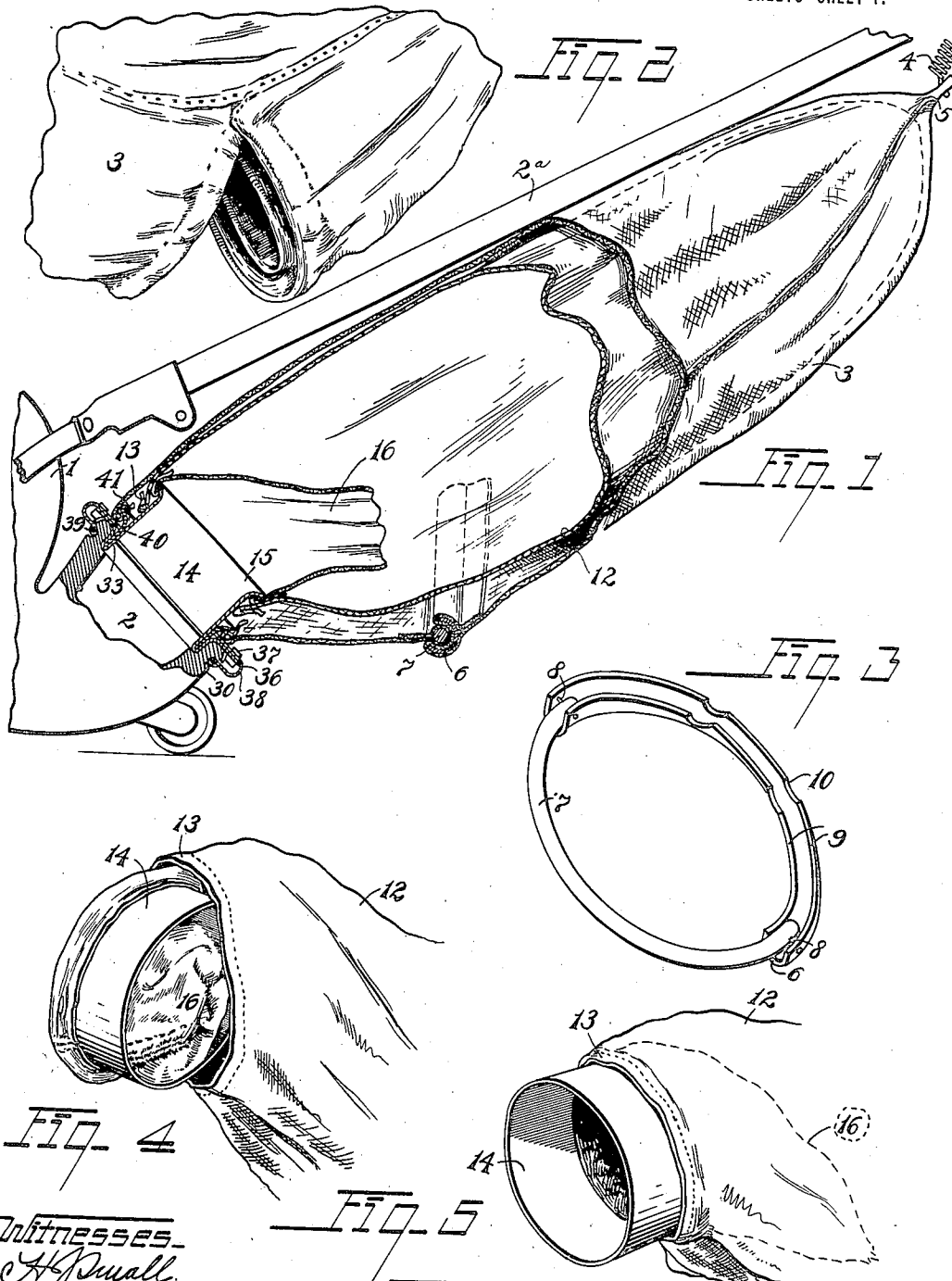


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 SUCTION CLEANER.
 APPLICATION FILED JAN. 20, 1915.

1,422,105.

Patented July 11, 1922.
 2 SHEETS—SHEET 1.



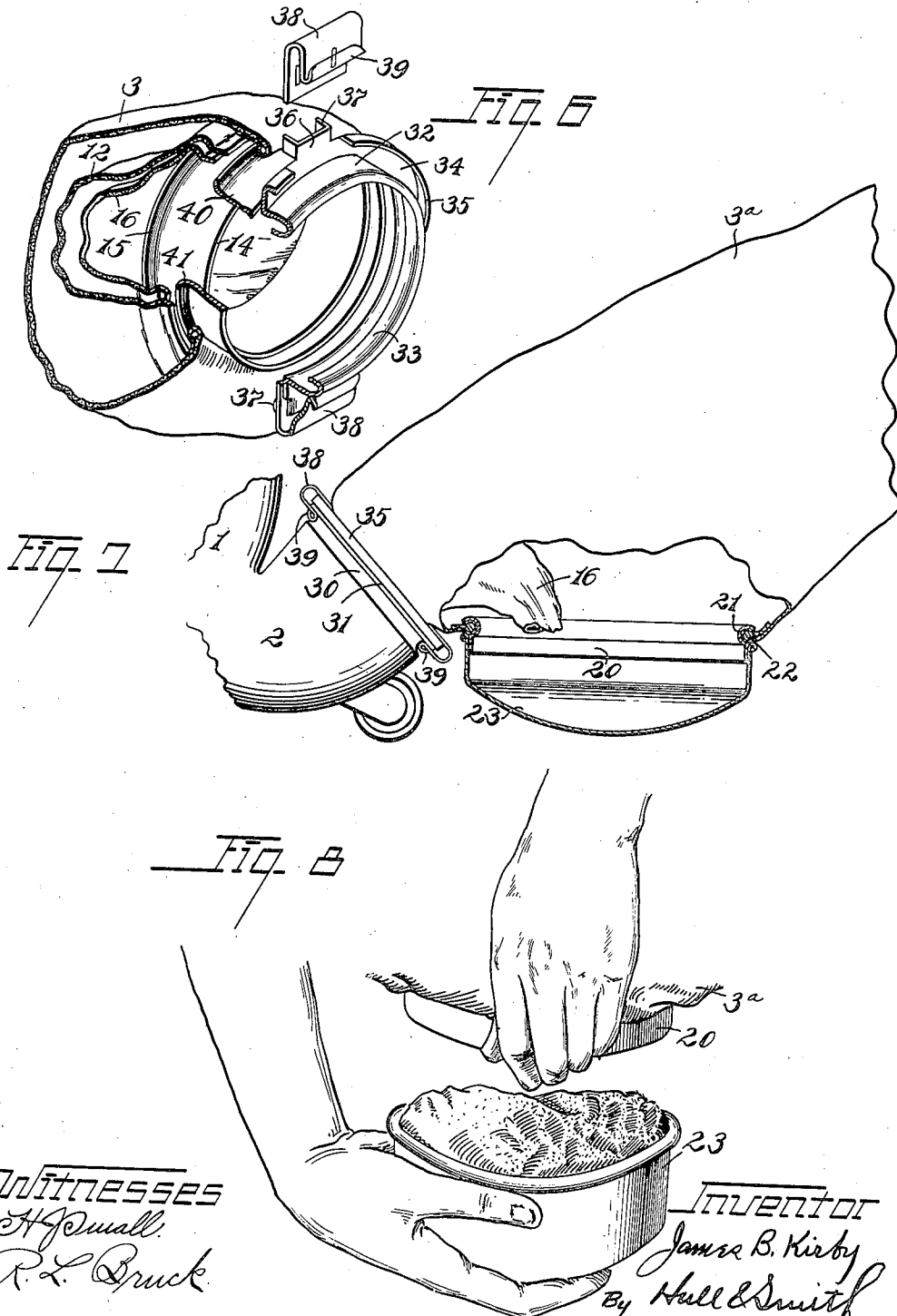
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INVENTOR James B. Kirby
 BY HIS ATTORNEYS Hall & Smith

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Inventor
 James B. Kirby
 By Hall & Smith
 Attys.

UNITED STATES PATENT OFFICE.

JAMES B. KIRBY, OF CLEVELAND, OHIO, ASSIGNOR TO ELECTRIC VACUUM CLEANER COMPANY, INC., A CORPORATION OF NEW YORK.

SUCTION CLEANER.

1,422,105.

Specification of Letters Patent.

Patented July 11, 1922.

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To all whom it may concern:

Be it known that I, JAMES B. KIRBY, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Suction Cleaners, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

This invention relates to suction cleaners, and especially to that type of cleaner comprising a suction device and motor adapted to be moved about the floor and having a downwardly facing collecting mouth adapted to remove the dust from rugs, carpets, and other floor coverings. The present improvements relate to the bag or filtering receptacle connected with this exhausting device and into which the dust and air are discharged. The principle of my invention consists in this, that the bag is formed with a closable opening adjacent to its lower end whereby the dust and dirt collected therein may be removed with less exertion and less contamination than hitherto. Also, according to a further improvement an additional receptacle for the dirt and dust is provided, which additional receptacle may either take the form of a porous bag inside the main bag or of a metallic pan connected to the main bag, thus permitting the collected material to be removed and discarded with less handling and shaking of the main bag than has hitherto been the case. Additional and subsidiary objects of the invention concern the construction of the fittings whereby the bag and its adjuncts are secured to the casing, while further objects and advantages will appear as the description proceeds.

In the drawings accompanying and forming a part of this application I have illustrated certain forms in which my invention may be embodied, although it will be understood that this illustration is not intended to be exhaustive of the manifold forms this invention may take. In these drawings Fig. 1 represents a side elevation of a portion of a cleaner constructed in accordance with my invention, a portion of the bag and cleaner being shown in longitudinal section; Fig. 2 is a detail view of a part of the bag, showing the same open for the discharge of its contents; Fig. 3 is a perspective view of the framework of the mouth piece; Fig.

4 is a perspective view of a portion of the inner bag showing the method of introducing the connecting sleeve therein; Fig. 5 is a perspective view of the inner bag showing the connecting ring ready for attachment to the casing, the sleeve being shown in dotted lines; Fig. 6 is a perspective view of the casing connection showing the parts thereof separated; Fig. 7 represents a side elevation of a modified form of my invention, the collecting pan being shown in cross section; and Fig. 8 is a detail view showing the method of operating the embodiment illustrated in Fig. 7.

Describing the parts by reference characters, 1 represents the motor casing of a well known form of cleaner, and 2 the discharge neck leading rearwardly and upwardly therefrom and by which the air and dust are discharged. Suitably secured to the casing is a rigid operating handle 2^a adapted to be grasped by the user and by means of which the casing is moved about the floor. Secured to the end of the neck 2 is an elongated bag 3 of cloth or other close-meshed pervious material adapted to receive the dust and air from the neck 2 and to retain the former while allowing the escape of the latter. The upper end of this bag is secured to the handle, preferably by means of a spiral spring 4 as described and claimed in my copending application Serial No. 876,642 (continuation of application No. 590,276, filed November 2, 1910). As a consequence of this construction the major portion of the dirt and dust settles in the lowest portion of the bag which is immediately in the rear of the neck 2 and only a short distance removed therefrom. Hitherto, to the best of my knowledge, machines of this nature have been provided with a closable opening at their upper end, and in order to empty the accumulated contents of the bag it has been necessary to disconnect the same from the handle and to open the upper end of the bag and thereafter to shake the dust and sweepings the whole length of the same which has been a distasteful operation.

According to my present invention I close the upper end of the bag permanently as shown at 5 in Fig. 1, and provide the side of the bag at a point adjacent to the neck 2 with a closable opening illustrated in Figs. 1, 2 and 7. According to the arrangement

shown in Figs. 1 and 2 a hinged framework is provided consisting of a channel member 6 of U shape in cross section and bent longitudinally to arcuate form with the legs of said U projecting parallel to the axis of curvature, in combination with a second member 7 of the same curvature and pivoted to the extremities thereof by means of suitable pivot pins 8—8. The bag fabric is formed with a transverse gash, one of the margins of the gash being looped about the member 6 and the other about the member 7 as shown in Fig. 1. The distance between the legs of the member 6 is made sufficiently great to permit the member 7 together with its surrounding cloth to be swung therein, notwithstanding the layer of cloth already surrounding the member 6. In order to prevent the inadvertent opening of this mouth the edges of the channel member are preferably slightly constricted as shown at 9 in Fig. 3, the constricted portions being conveniently separated from the unconstricted portions by spaced slots 10—10 if desired, which increases the flexibility of these portions and facilitates the original bending of the member. The width of these slots is preferably sufficient to admit the thumb or finger, thus facilitating the seating of the member 7 inside the channel. In Fig. 2 I have shown the bag with the mouth open.

While it is possible with bags of this nature to discharge the air and dust directly into the bag interior and to shake the accumulated refuse out through the opening thus formed, such an operation at best is an untidy proceeding, wherefore I have provided and prefer to employ an internal bag or container 12, made preferably of a tough but porous paper. This internal bag may either be of a permanent nature and employed and reemployed, or it may be of a cheap and inferior quality and arranged to be thrown away as soon as soiled. It is considered inexpedient to employ a single bag of this material since if it should explode or become accidentally perforated while in use the resulting escape of its contents would be highly disagreeable, but when enclosed within a cloth receptacle as shown the likelihood of rupture would be much decreased and its consequence greatly minimized. Such a liner is preferably made of a single piece of paper of suitable strength and porosity, being entirely closed at one end and having at the other end a neck suitably folded, hemmed, or stitched for greater strength as shown at 13. It may be securely affixed within the bag by means of a rigid metal nipple 14 having a flared rim 15 at its upper end, the diameter of the nipple being sufficient to fill snugly the bag neck 13. Secured around the rim 15 is the collapsible sleeve 16 whereby escape of the bag's contents is rendered impossible while the motor is at rest. This

nipple 14 together with the sleeve 16 may be introduced into the mouth of the paper bag by first folding the sleeve into the ring as illustrated in Fig. 4 and introducing the ring edgewise into the mouth, after which it may be turned around into proper position and drawn into place as shown in Fig. 5, the sleeve being properly shaken out inside of the bag. Of course draw strings, bindings, clamps, lacings, or other securing expedients could be employed instead of the mere insertion as illustrated herein, but I have suggested the present as being the most convenient with which I am acquainted and as affording the least possibility of leakage, though I do not restrict myself thereto.

In the embodiment of my invention illustrated in Figs. 7 and 8 I have shown the bag 3^a as provided at its lowest point with a large circular aperture in which is received the rigid metal collar 20, the upper edge of that collar being rolled to form a groove 21 in which is suitably bound or wired the folded edge 22 of the bag fabric. Preferably the shape of the bag and the location of the aperture is such that this collar will be maintained substantially horizontal during the normal use of the machine. Secured to the collar 20, in the present instance merely by a friction joint, is a metallic pan 23 which receives the collected refuse and enables the convenient and cleanly removal of the same as illustrated in Fig. 8. I have shown the bottom of this pan as made of rounding form so as not to scratch floors or the like in case of the depression of the handle to permit the machine to be passed between articles of furniture. While a mere friction joint between the collar 20 and pan is sufficient in case it be properly made, it will be obvious that additional securing expedients may be employed if desired.

For securing this bag to the neck 2 many expedients may be employed though the one I prefer is to form said neck with an external groove 30 whose wall is cut away at a point as shown at 31 to form a kind of bayonet joint. For cooperation with this neck I preferably employ a cylindrical pressed metal ring 32 adapted to fit within the neck as shown in Fig. 1 and having at one end the inturned fold 33 and at the other the external flange 34 whose edge may be provided with the upstanding lip 35. Spaced portions of the flange 34 are preferably continued radially outward as shown at 36 instead of being turned up to form the lip 35, these portions being also formed with flexible tongues 37. Elastic spring metal ears 38—38 are secured to this ring by clipping these tongues thereto, these having infolded portions 39 adapted to enter the groove 30 and secure the ring and bag in place.

Within the ring 32 I introduce a second

ring 40 having a cylindrical portion fitting inside of the fold 33 which is thereafter clamped down upon it so as to secure it rigidly therein. The outer end of this second ring is formed with an outturned flange 41 slightly spaced from the flange 34 to define a groove in which the bag neck is safely secured, by wiring, tying, or other suitable means. The interior of the ring 40 forms a seat for the reception of the nipple 14.

It is believed that the operation of my improved bag will be clear without further description. The employment of an opening in the external bag adjacent to the neck connection permits the application and removal of the band 14 with its accompanying liner bag 12 with a maximum of ease, this lining bag being inserted and removed through the mouth in the outer bag. Obviously when an interior bag is used the opening in the outer bag need not be located at the bottom of the bag, though in case the inner bag should break or should be inadvertently omitted it would be more convenient to have the opening at this point. The provision of a special receptacle additional to the usual bag permits the accumulated refuse to be removed without disconnecting that bag from the handle and without the necessity of carrying the whole cleaner out of doors or through the cellar or to some other removed place before emptying the same.

While I have described my invention in detail it will be apparent that many modifications in point of construction and arrangement can be made without departure from my inventive idea and within the terms of the claims hereto annexed, wherefore I do not propose to be limited to the details here shown except as the same may be rendered necessary by the prior art.

Having thus described my invention, what I claim is:

1. A bag for suction cleaners having at one end an attachment for suspension from the cleaner handle and having at its other end a neck adapted for attachment to the discharge neck of a cleaner casing, said bag having an opening in its rearward side at a point between said ends, and means whereby said opening may be kept closed.

2. A bag for suction cleaners having one end adapted for attachment to the cleaner handle and the other end adapted for connection to the cleaner neck, said bag having a bulging portion at its rearward side at a point near said neck, said bulging portion being formed with a closable slit, whereby the contents of the bag may be removed without disconnecting either end.

3. A bag for suction cleaners having a neck adapted for connection to the cleaner neck, said bag having an opening in one of its sides, rigid stiffening means secured to

the edge of said opening, and a metallic closing device adapted to encircle and embrace said stiffening means whereby said opening may be closed.

4. A bag for suction cleaners having a neck adapted for connection to the cleaner neck, said bag having an elongated slit in one of its sides, and means for reinforcing and stiffening the edges of said slit, said means being flexibly joined together at the ends of said slit whereby the edges of said slit may be drawn together to close the same one of said means being formed to receive and embrace the other means whereby said slit may be held closed.

5. In a suction cleaner an elongated porous paper bag having one of its ends closed and having a reduced neck at the other end, a rigid metal nipple adapted to project through said neck and formed at its end inside said bag with an enlargement of greater diameter than said neck, a dirt arresting device carried by said nipple inside of said neck, means for securing said nipple in communication with the discharge neck of the cleaner, and a porous bag of woven fabric adapted to surround said first bag.

6. In a suction cleaner an elongated porous paper bag having one of its ends closed and having a reduced neck at the other end, a rigid metal nipple adapted to project through said neck and formed at its end inside said bag with an enlargement of greater diameter than said neck, a dirt arresting device carried by said nipple inside of said neck, means for securing said nipple in communication with the discharge neck of the cleaner, a porous bag of flexible fabric adapted to surround said first bag and having a neck, means for securing said neck to the cleaner casing, and means for securing the other end of said last bag to the cleaner handle.

7. In a suction cleaner, the combination with an elongated bag of flexible porous material, said bag having a reduced neck at one end and a closable opening in one of its sides adjacent to said neck, of a rigid connecting fitting secured in said bag neck and adapted for attachment to the cleaner neck, a nipple adapted to be detachably connected to said fitting, and dirt arresting means carried by said nipple.

8. In a suction cleaner, the combination with an elongated bag of flexible porous material, said bag having a reduced neck at one end and a closable opening in one of its sides adjacent to said neck, of a rigid connecting fitting secured in said neck and adapted for attachment to the cleaner neck, a nipple adapted to be detachably connected to said fitting, and a porous paper bag carried by said nipple.

9. A bag for suction cleaners having a neck adapted for connection to the cleaner

- neck and having a bulged portion in one of its sides, said bulged portion being formed with an elongated slit, a rigid channel member secured to one of the side edges of said opening, said channel member being of U shape in cross section and bent longitudinally to arcuate form with the legs of said U projecting parallel to the axis of curvature, and a second rigid member secured to the opposite edge of said opening and having the same curvature as said first member, the ends of said members being pivoted together and said first member being adapted to receive said second member whereby said opening may be closed.
10. A bag for suction cleaners having a neck adapted for connection to the cleaner neck and having an elongated slit formed in one of its sides, a rigid channel member secured to one of the side edges of said opening, said channel member being of U shape in cross section and bent longitudinally to arcuate form with the legs of said U projecting parallel to the axis of curvature, and a second rigid member secured to the opposite edge of said opening and having the same curvature as said first member, the ends of said members being pivoted together and said first member being adapted to receive said second member whereby said opening may be closed, certain portions of said channel member being constricted whereby accidental separation of said members is prevented.
11. In a suction cleaner, a porous bag of flexible fabric and having at one end a reduced neck said neck being formed with a continuous reinforcing edge, a rigid metal nipple having a cylindrical portion adapted to project through said neck and having an enlarged end of greater diameter than said neck, a collapsible sleeve of flexible fabric secured to the flanged end of said nipple, and means for securing said nipple in communicating relation with the cleaner neck.
12. In a suction cleaner, a bag connection comprising a ring adapted to enter the discharge neck and having at its outer end an outturned flange and having at its inner end an inturned fold, flexible tongues carried by said flange, elastic spring metal ears rigidly secured to said flange by means of said tongues and adapted to engage the exterior of said cleaner neck, and a second ring engaged inside of said first ring and projecting beneath said fold, the free edge of said second ring having an external flange spaced from said first flange and cooperating therewith to define a groove adapted to receive the neck of the bag.
13. A bag connection for suction cleaners comprising a ring having a cylindrical portion adapted to fit into the cleaner neck, and formed at its outer end with an outturned flange, a second cylindrical ring rigidly secured within said first ring and projecting rearwardly therebeyond, said second ring having an outturned flange spaced from said first flange to define therewith an annular groove adapted to receive the bag neck, means for securing said first ring to the cleaner neck, a cylindrical nipple adapted to fit within said second ring, and dirt arresting means carried by said nipple.
14. A bag for suction cleaners having a neck adapted for connection to the cleaner neck and also having a closable opening formed in its lower side at a point rearward of and adjacent to said neck.
15. A bag for suction cleaners having an end adapted for attachment to the cleaner handle and a neck adapted for attachment to the discharge neck of a cleaner casing, said bag having a closable opening in its lower side at a point in the rear of and adjacent to said neck.
16. A bag for suction cleaners having at one end a neck adapted for attachment to the discharge neck of a cleaner casing and having its opposite end adapted for attachment to the cleaner handle, said bag having a depending bulging portion at the rear of said handle adjacent to said neck, and having a closable opening in the bottom of said bulging portion.
17. In a suction cleaner the combination, with a casing having a handle projecting therefrom and a discharge neck beneath said handle, of an elongated bag having a neck at one end attached to said first neck and having its opposite end attached to said handle, said bag being formed intermediate its ends with a depending bulging portion, and the bottom of said bulging portion being formed with a closable opening.
18. A bag for suction cleaners having at its upper end an attachment for suspension from the cleaner handle and having at its opposite end a neck adapted for connection to the cleaner neck, the side of said bag being formed with an opening at a point near said neck, rigid curvilinear means for reinforcing and stiffening the edges of said opening, and means for closing said opening.
19. A bag for suction cleaners having one end adapted for attachment to the cleaner handle and the other end adapted for connection to the cleaner neck, a bulging portion formed in the side of said bag at a point intermediate the ends thereof, said bulging portion being formed with a slit, rigid curvilinear means for reinforcing and stiffening the edges of said slit, said means being flexibly joined together at their ends whereby the edges of said slit may be drawn together to close the same, and means for retaining the edges of said slit in engagement with each other.
20. In a dust-bag for vacuum cleaners, 130

the combination with the bag proper, of a rigid sleeve forming an inlet to the bag at its lower end, said bag having an outlet in said end adjacent said inlet, and a closure
5 for said outlet.

21. A dust bag for vacuum cleaners, comprising the bag proper, said bag being provided with an inlet for dust-laden air, the portion of the bag adjacent said inlet being
10 adapted to receive the dust collected in the bag and being provided with an opening for the discharge thereof, means for normally closing said opening, and means associated with said inlet preventing the dust
15 falling out therethrough.

22. A dust bag for vacuum cleaners, com-

prising the bag proper, said bag being provided with an inlet for dust-laden air, a member forming an extension of said inlet within said bag, the portion of the bag adjacent to said inlet being adapted to receive the dust collected in such bag, and being provided with an opening for the discharge thereof, and a closure for said
20 opening.

In testimony whereof, I hereunto affix my signature in the presence of two witnesses.

JAMES B. KIRBY.

Witnesses:

HAROLD E. SMITH,
BRENNAN B. WEST.