

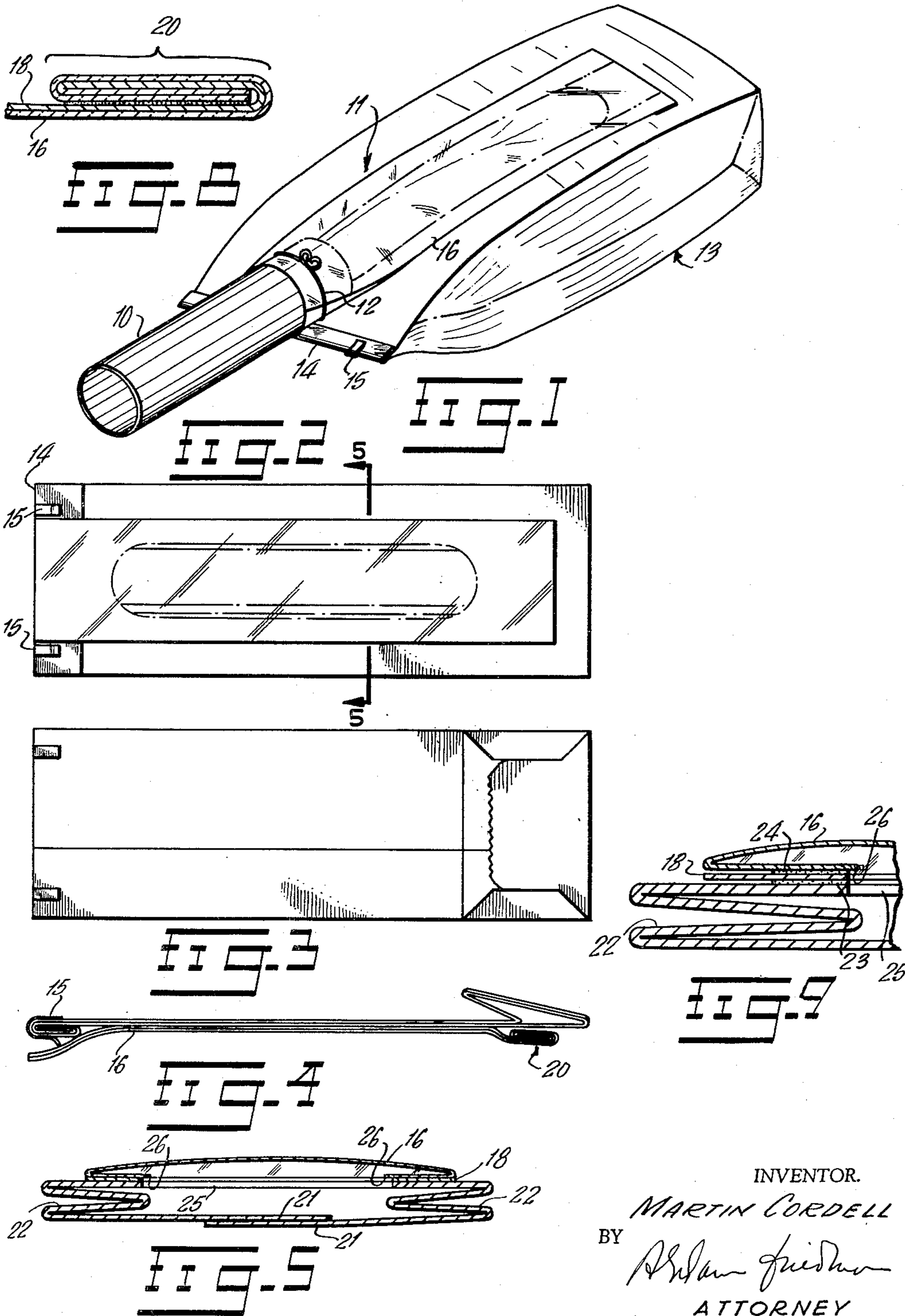
Aug. 8, 1961

M. CORDELL
LINT FILTER BAG

2,995,205

Filed June 5, 1959

2 Sheets-Sheet 1



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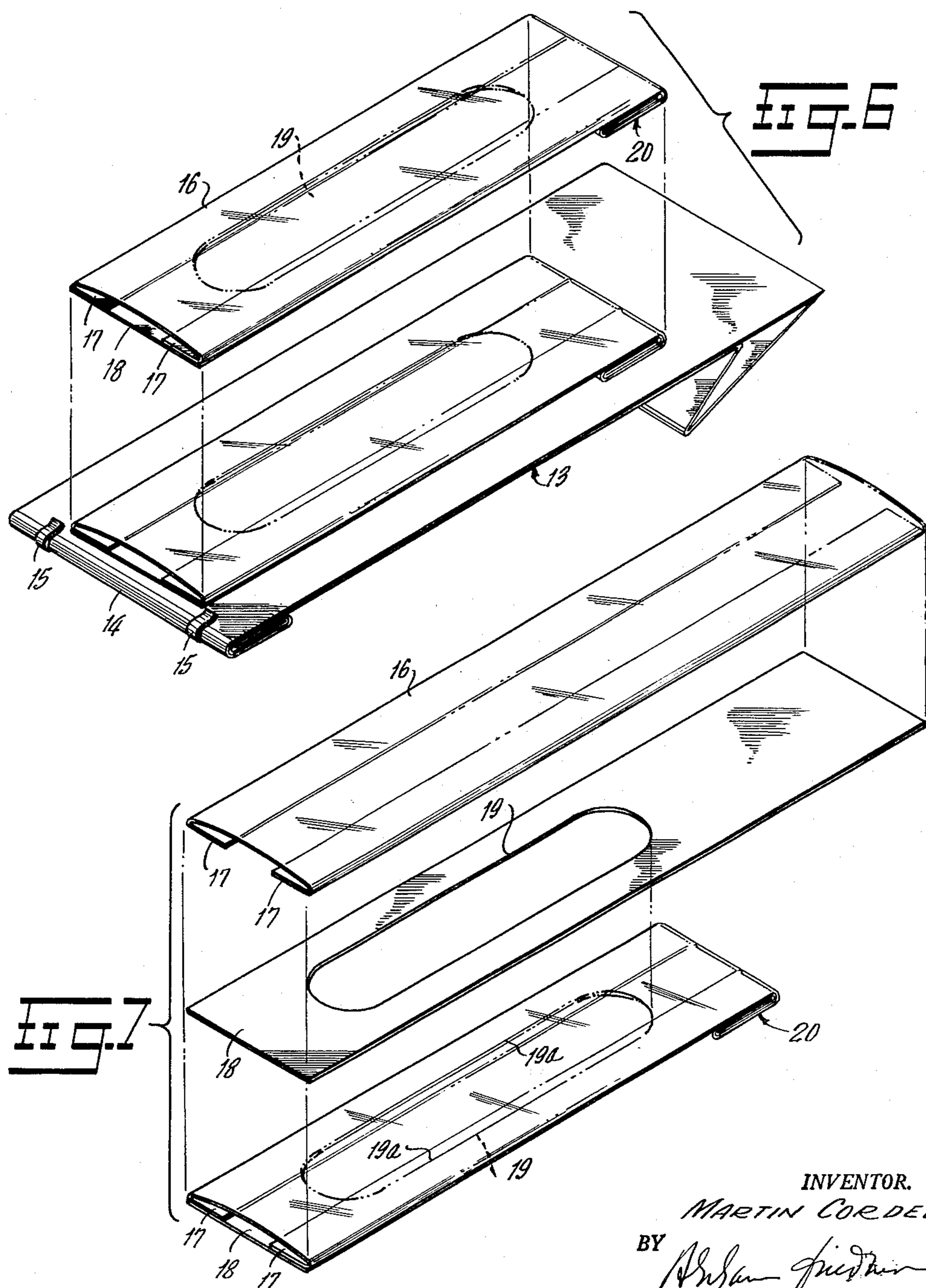
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LINT FILTER BAG

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This invention relates generally to lint or similar filters and particularly to an improved lint filter intended for use in connection with clothes drying equipment; the present invention also relating to a novel method of assembling such a filter.

The primary operation with which the invention is concerned is the removal of lint from clothing and other fabrics or laundry items which have been inserted in conventional automatic dryers after washing and cleaning. Such dryers frequently accomplish their function by exposing their contents to the impingement of a stream of warm air which is thereafter permitted to emerge from the dryers by way of a suitable exhaust outlet. The warm air so emerging carries with it a quantity of lint, as well as other foreign particles, which have become detached from the said clothing, fabrics, etc., during the drying operation.

By reason of the presence of these particles it has been found desirable to provide suitable filters for their accumulation and disposal. Conventional filters of this kind have, among other things, taken the form of paper bags which may be attached to an air exhaust outlet of a clothes dryer and removed when they have been filled with foreign material. Such bags are frequently composed of a porous paper which is pervious to air but which retains the airborne particles within the confines of the bags.

In making use of these bags, it has been found desirable to be able to observe the quantity of foreign particles which has accumulated therein and, accordingly, it has been found particularly advantageous to incorporate windows in such bags whereby observation of their contents may be had. The windows thus provided take the form of flexible, transparent plastic films disposed over suitable apertures in the sides of the bags and secured by an adhesive, such as conventional glue, to the surfaces surrounding the apertures.

Experimentation has shown however that such a construction is accompanied by a number of problems which severely limit its utility. Thus, it has been found that if the plastic films are secured directly to the bag, its paper will absorb the adhesive to such an extent that there is a substantial risk of accidental loss or removal of the plastic films. The porosity and fluid receptivity of the paper composing the bag and the poor absorptive powers of the plastic films would appear to be primarily responsible for this phenomenon. The risk of accidental loss so produced, while present at ordinary room temperatures, becomes particularly great when the adhesive employed is exposed to higher temperatures such as characterize the warm air emerging from drying equipment. Thus, such higher temperatures tend, in many instances, to soften the plastic films to a semi-fluid condition and thereby promote the opportunity for their detachment from the paper of the bag. Moreover, such temperatures may result in impairment of the transparency of the conventional plastic films and may also cause them to become brittle or break.

In addition to these considerations, it has been found that the foreign particles introduced within conventional filter bags become lodged between the plastic films and the paper to which they are secured. Here again, the aforesaid absorption of the adhesive magnifies this tendency since the amount of space which would otherwise be occupied by adhesive becomes available for the reception of the said particles. As a result, the filter bag be-

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comes difficult to clean and the lodged particles tend to maintain the separation between the plastic film and adjacent paper, thereby increasing the likelihood of accidental loss of said film.

Accordingly, it is an object of the present invention to provide a lint filter which has an efficient window for permitting observation of its contents.

Another object of the invention is to provide such a window which will be resistant to the effects of the temperatures of warm air.

Another object of the invention is to provide an improved method for assembling such a window with a filter bag.

Another object of the invention is to provide a lint filter bag which has improved means for securing thereto a window permitting observation of its contents.

A further object of the invention is to provide a means for eliminating the tendency to accumulate foreign particles between the said window and the adjacent portions of the filter bag.

A still further object of the invention is to provide a removable filter bag which is adapted to receive air at high temperatures and to retain foreign particles carried by said air and to separate the particles from the air in which they are entrained.

Yet a further object of the invention is to provide a lint filter of simple and economical design, which is adapted for mass production by conventional methods.

Other and more specific objects of the present invention will be apparent from the following description as read in connection with the accompanying drawings.

The accompanying drawings illustrate one form of the invention. In these drawings:

FIGURE 1 is a perspective view showing this form of the invention in association with a portion of the warm air exhaust outlet of a clothes dryer;

FIGURES 2, 3 and 4 are, respectively, top, bottom and edge views of the said form of the invention wherein its various components are depicted in a substantially folded position;

FIGURE 5 is a cross-sectional view taken about the line 5—5 of FIGURE 2;

FIGURES 6 and 7 are perspective views wherein the components of the said form of the invention are depicted in exploded form in various stages of assembly;

FIGURE 8 is a fragmentary cross-sectional view of an end portion of the said window; and

FIGURE 9 is an enlarged fragmentary cross-sectional view of a portion of the construction depicted in FIGURE 5.

Referring primarily to FIGURE 1, the numeral 10 indicates a tubular exhaust outlet of a conventional laundry or clothes dryer. This outlet is joined to the mouth of a sleeve, generally designated by the numeral 11, by any suitable means such as a wire collar 12. As will be hereinafter set forth in detail, the sleeve communicates with the interior of a conventionally formed pleated, square-bottomed paper bag, generally designated by the numeral 13. This bag is constructed of a material pervious to air, such as a porous filter paper. As shown in FIGURES 1 and 4, its mouth may be sealed by a double folded flap 14 secured against opening by a pair of removable metal clips 15.

Important features of the invention reside in the construction of the sleeve and its mode of assembly with the bag. Thus, referring more particularly to FIGURE 7, the sleeve 11 includes a rectangular sheet 16 composed of flexible transparent material, preferably Mylar plastic film. Mylar is a trade name for polyethylene terephthalate in sheet form. The said rectangular sheet is provided with two longitudinal infolded strips 17.

A second component of the sleeve consists of a rec-

tangular sheet 18 composed of paper have the same overall dimensions as that of the infolded rectangular Mylar sheet 16. An elongated aperture 19 is provided in the said sheet 18.

It is to be noted that the paper of which sheet 18 is composed is not characterized by the same absorbent powers which exist in the filter paper of which bag 13 is formed. While the latter is characterized by a permeability by any fluid glue brought in contact therewith, sheet 18 is composed of paper which is less permeable and characterized by the wettability of its surface when exposed to a layer of fluid glue. The sheet 18 is thus characterized by a substantial exclusion of said fluid glue from the interior of said paper upon the application thereof and during drying of the glue, thereby avoiding rapid elimination of said layer of glue from the wetted surface and permitting said layer to form thereon in a solid substantially non-absorbed state. Thus, by reason of these characteristics, the paper of sheet 18 will maintain a substantial layer of such adhesive between itself and any juxtaposed absorbent material such as the paper of the bag, as well as any non-absorbent material such as the Mylar plastic sheet 16. In so doing, a strong union between said juxtaposed members is accomplished. One example of the kind of paper which may be used for sheet 18 is a smooth uncoated kraft paper but other paper having the above-described characteristics of surface wettability and exclusion of said adhesive during drying may also be used.

In assembling the sleeve, the transparent sheet 16 is first secured to the paper sheet 18 by means of a suitable fluid adhesive interposed between the infolded strips 17 and the said paper sheet 18. One end of the sleeve is then double folded to the position generally designated by the numeral 20 in FIGURE 7. This folded end may be sealed by the adhesive employed and also maintained in its folded position by suitable application of the adhesive between the lower fold of said end and the adjacent surface of the bag, as shown in FIGURE 8.

It is also noteworthy that in the sleeve thus formed the infolded strips 17 of the transparent plastic sheet 16 overlap the longitudinal edges 19a of the aperture 19, as indicated in FIGURE 7.

When the sleeve has been assembled as indicated above, it may be disposed above the bag 13, as shown in FIGURE 6, and then secured thereto in the position indicated in that figure by means of a suitable fluid adhesive interposed between the paper sheet 18 and the bag 13, the adhesive being preferably applied to the paper sheet before bringing it into contact with the bag, thereby minimizing the opportunity for absorption of the adhesive by the bag paper. During this operation, the bag 13 is preferably disposed in a folded position, as shown in FIGURE 6. In securing sheet 18 to the bag, the mouth of the sleeve is left free, as may be seen in FIGURE 4. The double folded end portion of the sleeve may also advantageously be left free.

It is to be emphasized that the above described assembly is assured by reason of the presence of sheet 18 between the bag paper and Mylar sheet, which paper sheet, because of its previously noted characteristics, shields against the absorptive tendencies of the bag paper and maintains an adhesive layer between itself and each of said adjacent members disposed on opposing surfaces thereof. This construction thereby accomplishes a strong union of the various components of the assembly so as to minimize the risk of accidental loss or removal of said components and forms an effective seal to prevent the escape of the lint material.

The bag employed, as well as the sleeve assembled therewith, may be stored or packaged in a flat folded condition, such as depicted in FIGURES 2, 3 and 4. The construction of this assembly may be better appreciated by noting FIGURES 5 and 9, which depict the overlapping back portions 21 of the bag, its pleated sides 22, the

paper sheet 18, transparent plastic sheet 16 and the layers of adhesive 23, 24 securing said paper and Mylar sheets in assembled position.

The bag is provided with an elongated aperture 25, which is preferably of the same conformation as that of the elongated aperture 19 of the paper sheet. These apertures are aligned in juxtaposition when the described form of the invention has been assembled.

Thus, the transparent plastic Mylar sheet when so assembled forms a window whereby it is possible to observe the contents of the interior of the bag by viewing same through the transparent sheet 16 and the apertures 19, 25 covered thereby. The user is thus in a position to determine whether the bag should be emptied or replaced.

With the foregoing construction, the free mouth of the sleeve may be easily fastened to the tubular exhaust outlet 10, as depicted in FIGURE 1, as by means of wire collar 12. When warm air emerges through the said outlet the sleeve and bag will expand, as shown in this figure. When the double folded end of the sleeve is left free, the expansion of the bag will not tend to tear the seal thereof.

The warm air emerging from the tubular exhaust outlet will pass through the pervious filter paper of the bag. The temperatures of the said air will not impair the Mylar sheet by reason of the ability of said material to resist softening and disintegration at high temperatures. The lint, as well as other foreign particles, carried by the air emerging from the outlet 10, is separated from the air stream and accumulates in the bag where it may be observed through the aforesaid window.

It has been found in practice that any lint which may be disposed in the vicinity of the undersides of those portions 26 of the infolded strips which extend inwardly of apertures 19 and 25 will not tend to remain thereon or to accumulate between the infolded strips and paper sheet 18, and between the latter and the surface of bag 13, such tendency being also eliminated by the presence of the layers of adhesive maintained between said portions of the invention. Thus, the lint and other foreign particles will accumulate within the interior of the bag. When desired, the wire collar 12 may be loosened, thereby permitting removal of the bag and disposition of its contents. The sleeve may then be refastened to the exhaust outlet in the position described above, and the described embodiment of the invention re-used as desired.

From the foregoing, it will be seen that the invention accomplishes its objects in an ingenious yet simple manner and that the novel mode of its assembly makes feasible the economic employment of the invention on a wide scale.

The embodiment of the invention illustrated and described hereinabove has been selected for the purpose of clearly setting forth the principles involved. It will be apparent, however, that the present invention is susceptible to being modified in respect to details of construction, combination and arrangement of parts and materials which may be resorted to without departure from the spirit and scope of the invention as claimed.

I claim:

1. An improved filter for removing lint or the like from air in which it is entrained comprising, in combination, a bag composed of a paper pervious to air but not lint and provided with an aperture in one side thereof; means for introducing said air through said aperture; said means including a transparent outer member and an intermediate member secured by an adhesive between said outer member and said bag; the said intermediate member being characterized by surfaces wettable upon contact with said adhesive when the latter is in a fluid state, the interior of said intermediate member also being characterized by a substantial exclusion of said fluid adhesive during drying thereof as compared with said air

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pervious paper, whereby a layer of said adhesive will be retained upon the said surfaces.

2. An improved filter for removing lint from air comprising, in combination, a bag composed of a paper pervious to air and provided with an aperture in one side thereof; means for introducing said air through said aperture; said means including an outer member composed of a flexible transparent plastic sheet and an intermediate paper sheet secured by an adhesive between said outer member and said bag; the said paper sheet being characterized by surfaces wettable upon contact with said adhesive when the latter is in a fluid state, the interior of the said paper sheet also being characterized by a substantial exclusion of said fluid adhesive during drying thereof, whereby a layer of said adhesive will be retained upon the said surfaces.

3. An improved filter for removing lint from air comprising, in combination, a bag composed of a paper pervious to air and provided with an aperture in one side thereof; means for introducing said air through said aperture; said means including an outer member composed of an impervious transparent film and an intermediate paper sheet secured by an adhesive between said outer member and said bag; the said paper sheet being characterized by surfaces wettable upon contact with said adhesive when the latter is in a fluid state, the interior of the said paper sheet also being characterized by a substantial exclusion of said fluid adhesive during drying thereof, whereby a layer of said adhesive will be retained upon the said surfaces; the said paper sheet also being provided with an aperture aligned with the aperture of said bag, the said apertures defining means for communicating with the interior of said bag.

4. An improved filter for removing lint from air comprising, in combination, a bag composed of a paper pervious to air and provided with an aperture in one side thereof; means for introducing said air through said aperture; said means including an outer member composed of a transparent plastic sheet of Mylar and an intermediate paper sheet secured by an adhesive between said outer member and said bag; the said paper sheet being characterized by surfaces wettable upon contact with said adhesive when the latter is in a fluid state, the interior of the said paper sheet also being characterized by a substantial exclusion of said fluid adhesive during drying thereof, whereby a layer of said adhesive will be retained upon the said surfaces; the said paper sheet also being provided with an aperture aligned with the aperture of said bag, the said apertures defining means for communicating with the interior of said bag; the said outer member being provided with infolded strips overlapping and extending inwardly of the edges of said apertures.

5. An improved filter for removing lint from air comprising, in combination, a bag composed of a paper pervious to air and provided with an aperture in one side thereof; means for introducing said air through said aperture; said means including an outer member composed of a transparent plastic sheet and an intermediate paper sheet secured by an adhesive between said outer member and said bag; the said paper sheet being characterized by surfaces wettable upon contact with said adhesive when the latter is in a fluid state, the interior of the said paper sheet also being characterized by a substantial exclusion of said fluid adhesive during drying thereof, whereby a layer of said adhesive will be retained upon the said surfaces; the said paper sheet also being

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provided with an aperture aligned with the aperture of said bag, the said apertures defining means for communicating with the interior of said bag; the said outer member being provided with infolded strips overlapping and extending inwardly of the edges of said apertures; the said apertures also being defined by a layer of said adhesive disposed on each side of said paper sheet.

6. An improved filter for removing lint from air comprising, in combination, a bag composed of a paper pervious to air and provided with an elongated aperture in one side thereof; a rectangular sheet of transparent Mylar disposed exteriorly of said bag and provided with a pair of longitudinal infolded strips; a rectangular sheet of paper disposed between said Mylar and said bag; the said sheet of paper being provided with an elongated aperture conforming with the elongated aperture of said bag and aligned therewith; the said sheet of paper being secured to the said bag and infolded strips by an adhesive applied in an initially liquid form to the margins of said elongated apertures; one end portion of said Mylar sheet being adhesively sealed and folded with one end portion of said sheet of paper; the opposite end portions of said Mylar sheet and sheet of paper being left unsealed; the said paper sheet also being provided with an aperture aligned with the aperture of said bag; the said Mylar sheet and sheet of paper defining a sleeve communicating with the interior of said bag; the said paper sheet being characterized by surfaces wettable upon contact with said adhesive when the latter is in a fluid state, the interior of the said paper sheet also being characterized by a substantial exclusion of said fluid adhesive during drying thereof, whereby a layer of said adhesive will be retained upon the said surfaces.

7. An improved method of constructing a filter for removing lint from air comprising, in combination, the step of applying a fluid adhesive to the margin of an aperture formed in a sheet of paper characterized by surfaces wettable upon contact with said adhesive, the interior of said paper also being characterized by a substantial exclusion of said fluid adhesive during drying thereof, whereby a layer of said adhesive will be retained upon the said surfaces; the step of securing said sheet of paper upon a bag composed of paper pervious to air, the said bag being provided with an aperture aligned with the aperture of said sheet of paper; the step of securing a transparent plastic sheet to said paper sheet, the said paper sheet being provided with said adhesive on both sides thereof; the said plastic sheet being provided with a pair of infolded longitudinal strips contactable with said adhesive on said sheet of paper; and the step of folding and adhesively securing one end of said plastic sheet together with the adjacent end of said paper sheet, whereby a seal of said end portions is effected.

8. The method according to claim 7, wherein said transparent plastic sheet comprises Mylar.

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