Sept. 13, 1960 S. METRO 2,952,332

DUST COLLECTOR CUP

Filed Dec. 9, 1957 2 Sheets-Sheet 1

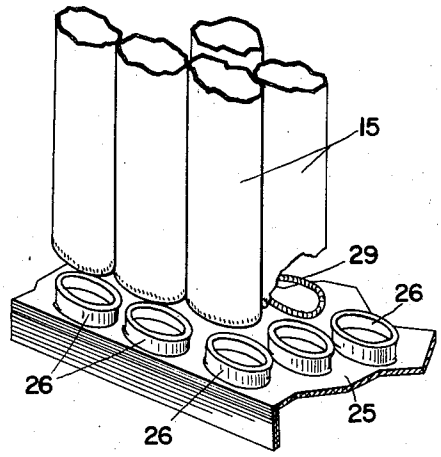


Fig. 2

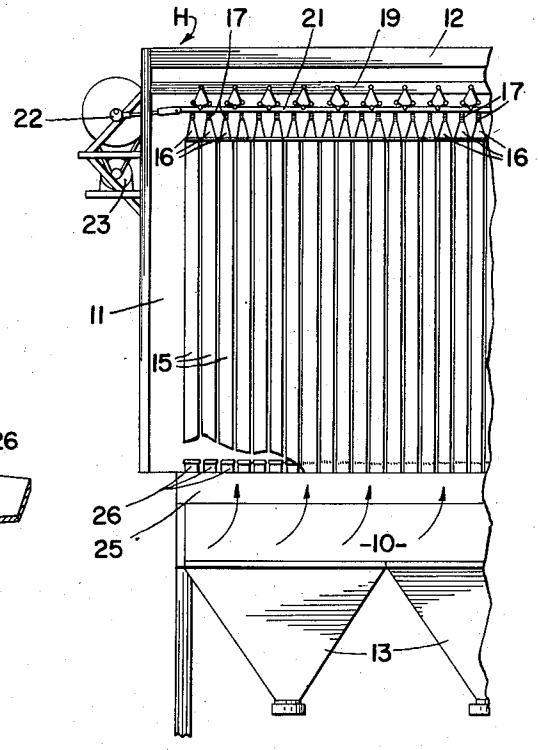


Fig. 1

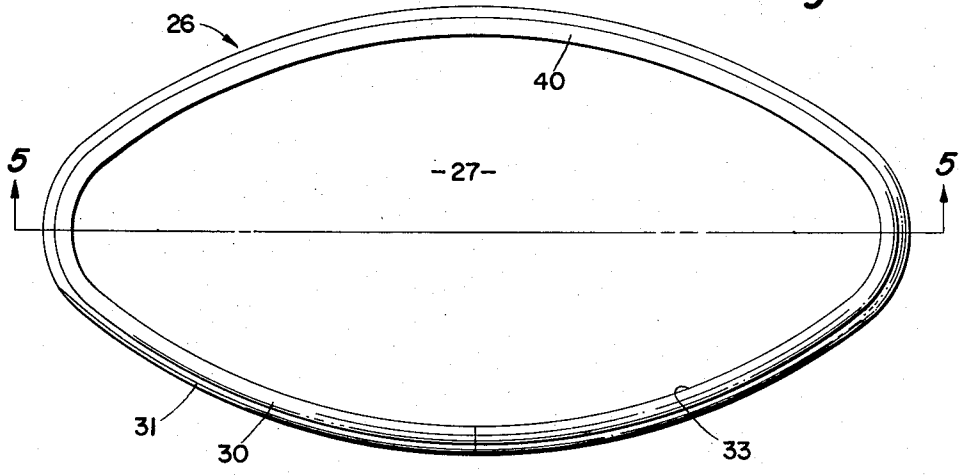


Fig. 3

INVENTOR.
STEPHEN METRO
BY Pyle & Fisher
ATTORNEYS

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DUST COLLECTOR CUP

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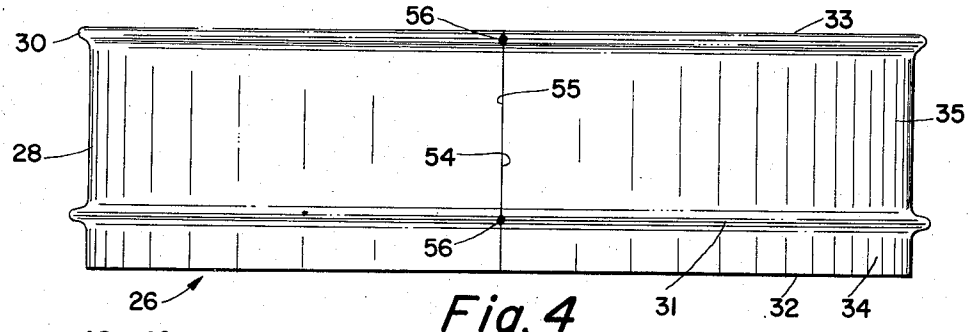


Fig. 4

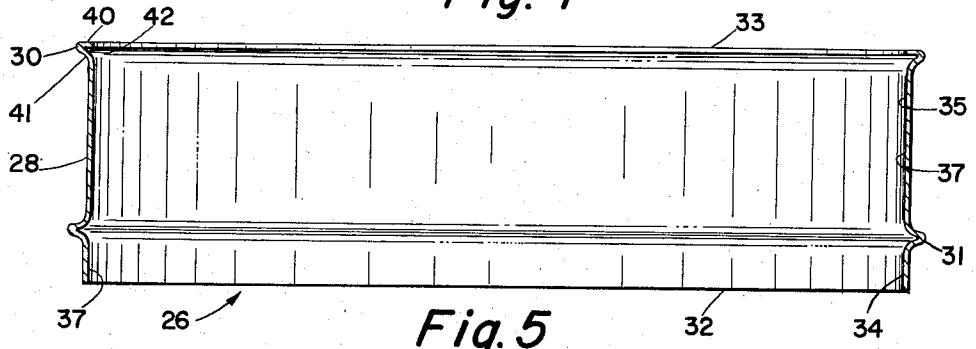


Fig. 5

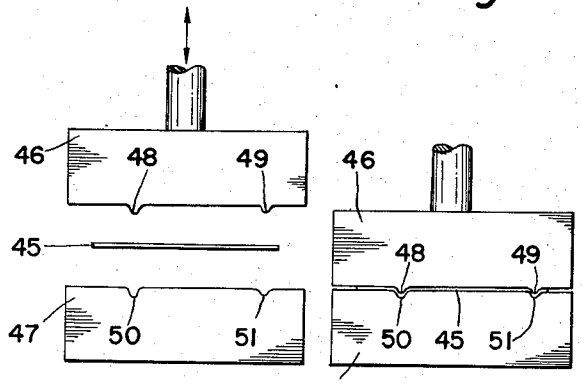


Fig. 7

Fig. 8

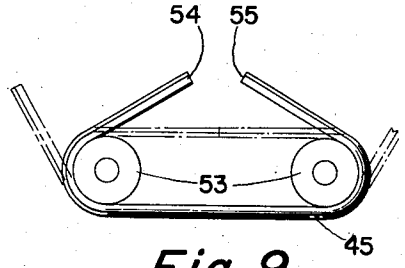


Fig. 9

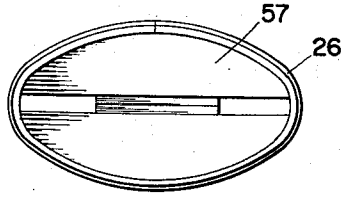


Fig. 10

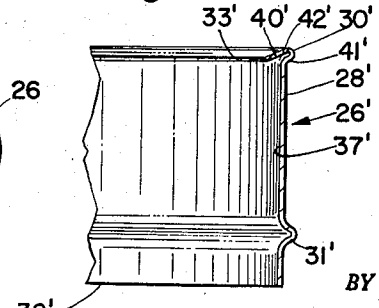


Fig. 6

INVENTOR.
STEPHEN METRO
BY Pyle & Fisher
ATTORNEYS

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DUST COLLECTOR CUP

Stephen Metro, Cleveland, Ohio, assignor to Parsons Engineering Corporation

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2 Claims. (Cl. 183—43)

This invention relates to dust arresters and more particularly to an improved cup for anchoring the base of an elliptical dust arrester bag and for defining a connecting passage between an inlet opening and the arrester bag.

In bag type dust arresters, a base plate having a plurality of generally elliptical shaped openings is provided. An arrester cup projects through each of such apertures and each arrester cup is fixed to the base plate. A dust arrester bag of generally elliptical cross sectional configuration is connected to the arrester cup. A coil spring is carried at the base of each of the bags. The coil spring is expanded over an outwardly projecting end lip formed as part of the associated cup. After the coil spring is brought over the lip, it is allowed to contract against the body of the cup.

One of the principal objects of this invention is to provide a novel and improved cup in which the wall of the cup, adjacent its outlet end, is expanded to provide such lip in the form of an outwardly projecting smooth surfaced projection.

Another object of the invention is to provide a novel and improved dust arrester cup in which the wall of the cup is upset outwardly adjacent the outlet end of the cup to provide first and second lip walls defining the longitudinal extremities of such bag retaining lip and the longitudinal extremities of a groove communicating with the cup through passage, the walls being so formed that one of the walls projects outwardly at the outlet opening. This projection forms a skimmer which minimizes tangential impingement of dust particles against the lower portions of a dust bag connected to the cup and thereby reduces the wear of the dust bag in the region where wear in prior art mechanisms has been the greatest.

Another and related object of the invention is to provide a novel and improved dust collector cup in which the bag retaining lip has one wall which extends inwardly past the contour generated by the major portion of the cup inner surface to provide a skimmer having optimum dust intercepting action and in which the skimmer is bent downwardly toward the inlet opening in order that dust shaken loose from the associated bag during a bag cleaning operation will not collect on the skimmer.

These listed objects will outline the invention, but other objects and a fuller understanding of the invention may be had by referring to the following description and claims, taken in conjunction with the accompanying drawings, in which:

Figure 1 is a fragmentary somewhat schematic cross sectional view of a bag type dust arrester which includes the novel and improved cups of the present invention;

Figure 2 is a fragmentary perspective view on an enlarged scale with respect to Figure 1, of a portion of a base plate with a connected plurality of the novel and improved cups and the lower portions of a plurality of dust collecter bags in position to be connected to such cups;

Figure 3 is a top plan view on an enlarged scale with respect to Figures 1 and 2 of one of the novel and improved dust collector cups;

Figure 4 is a side elevational view of the cup of Figure 3;

Figure 5 is a section view of a cup as seen from a plane indicated by the line 5—5 of Figure 3;

Figure 6 is a fragmentary sectional view corresponding to the view of Figure 5 and showing a slightly modified form of a dust arrester cup; and,

Figures 7 through 10 are schematic drawings showing the process steps which are used in forming one of the improved cups.

Figure 1 is a rather schematic view of an elliptical bag type dust arrester such as those sold under the trademarks Parsons and Oval Bag. The dust arrester has an imperforate fabricated metal housing shown generally at H. The housing H encompasses an inlet and expansion chamber 10, a bag house 11, and outlet passages 12. One or more hoppers 13 form a part of the housing H. The hoppers 13 are beneath the expansion chamber 10 and define the lower limits of that chamber.

A plurality of elongated dust collector bags 15 are provided. The bags are elliptical in cross section. Each of the bags has a tent portion 16 at its top. The tent portions 16 are connected by coil springs 17 to pivotal support members 18. The pivotal supports in turn are each pivotally connected to a support bar 19.

A shaker bar 21 is connected to each of the pivotal support members 18. The shaker bar 21 in turn is connected to an eccentric 22 which is driven by a motor 23. A base plate 25 defines the bottom of the bag house 11 and the top of the inlet and expansion chamber 10. A plurality of cups 26 are fixed to the base plate 25. Each of the cups 26 defines a through fluid passage 27 which communicates with the inlet and expansion chamber 10. An elliptically shaped coil spring 29 is carried at the bottom of each of the dust arrester bags 15, Figure 2. The dust arrester bags 15 are connected to the cups 26 by expanding the springs 29 and passing each of them over a bag connecting lip 30, one of which is formed at the top of each cup 25. Each spring is then allowed to contract against outer surface 28 of the cup to which the bag is connected. Many of the features of the present invention reside in the particular construction of the bag connecting lip 30. These features will subsequently be described in more detail.

In operation, dust laden fluid is introduced into the inlet and expansion chamber 10. It then passes upwardly through the inlet passages 27 into the elliptically shaped dust arrester bags 15. The pressure exerted by this fluid on the inner walls of the bags 15 forces the bags to assume a generally cylindrical contour. The fluid passes through the walls of the dust bags 15 which walls are permeable and separate dust particles from the fluid. The fluid then passes through outlet passage 12 to leave the arrester.

When the inner surfaces of bags 15 become coated with collected dust particles, it is necessary to clean the bags. To perform this operation, the flow of fluid is terminated. As soon as the flow of fluid stops, the springs 17 draw the bags upwardly and stretch them back to their normal elliptical shape. This action breaks much of the collected dust loose from the bags, which dust then drops into the hoppers 13. To further cleanse the bags, the motor 23 may be started to drive the eccentric 22. The eccentric 22 causes the shaker bar 21 to reciprocate as the pivotal support members rock back and forth. This shaking causes the dust to be loosened from the bags 15 and drop into the hoppers 13.

Referring now to Figures 3 through 6, a base plate

contacting shoulder 31 is formed intermediate and parallel to inlet and outlet ends 32, 33. The shoulder 31 divides the cup 26 into base plate connecting and bag connecting sections 34, 35 respectively. In the preferred and practiced form of the invention, the base plate connecting section 34 is passed through an aperture in the base plate 25. The shoulder 31 is brought into intimate contact with the inner or bag housing surface of the base plate 25. The base plate connecting section is then flared outwardly until it firmly abuts the lower or inlet expansion chamber side of the base plate 25. In this manner, a rigid, mechanical, crimped connection is formed between each of the cups and the base plate.

The cup 26 has an inner surface 37 which defines the through fluid passage 27. The passage extends from an inlet to an outlet opening, which openings are defined by the inlet and outlet ends 32, 33 respectively. The inner surface 37 and the outer surface 28 together define the walls of the cup. It will be seen that the thickness of the walls is substantially uniform from the inlet end 32 to the outlet end 33.

The majority of both the inner and outer surfaces 37, 28 define elliptical solids. The base plate contacting shoulder 31 projects outwardly from these elliptical solids as does the bag connecting lip 30. Both the lip 30 and the shoulder 31 are preferably concentric to the outer surface 28 and both are preferably endless and generally V-shaped in cross section.

The lip 30 has upper and lower side walls 40, 41 respectively. The walls define a groove 42 which communicates with the through passage 27 and circumscribes the passage. The lip lower side wall 41 is a bag retaining wall which coacts with the bag spring 29 carried by a connected bag. The lip upper side wall 40 projects inwardly forming a flow deflection dust skimmer. Transverse impingement of flying dust particles against the inner walls of the dust bags 15 causes wear of those bags. This wear has its greatest concentration in a region immediately above the opening defined by the outlet end 33 of the cup 25. The skimmer intercepts many of these flying dust particles and thereby perceptibly reduces the wear of an associated dust bag in the region where wear has previously been the greatest.

As previously mentioned, the lip 30 is generally V-shaped. The lip upper and lower side walls 40, 41 define the arms of this V. The arm upper side wall 40 terminates at an inner end which is preferably coincident with the cup outlet end 33.

In the embodiment of Figure 6 the skimmer has been further refined. There, the lip upper wall 40' of the lip 30' is extended inwardly past the contour generated by the majority of the inner wall 37'. The lip upper wall 40' is also bent downwardly toward the inlet end 32. Thus the outlet end 33' and part of the upper lip wall 40' lie between the inlet opening 32 and a portion of the upper wall 40'. The lip upper wall 40' which defines the skimmer is bent downwardly so that dust loosened from the bags 15 during the cleaning operation does not collect on the top of the skimmer, but rather slides off it and drops down into the hoppers 13.

In Figures 7 through 10 a rather schematic presentation is made of the improved process for making a dust arrester cup. A blank of sheet metal stock 45 is first placed between complemental, relatively reciprocal die halves 46, 47, Figure 7, and the die halves 46, 47 are brought together, Figure 8. A shoulder producing projection 48 and a lip producing projection 49 force portions of the blank 45 into complemental recesses 50, 51 which are found in the lower die half 47.

The die halves 46, 47 are then separated and the blank 45 is removed. The blank 45 is then placed against roll forming dies 53, Figure 9, with the axes of the dies transverse to the formed lip 30 and shoulder 31. The blank is bent around the dies 53 until ends 54, 55 are brought into abutment with the ends of the lip 30 and shoulder 31 also in abutment and alignment to form endless projections. The blank 45 is then in an oval shape with generally flat sides.

The ends 54, 55 are then fixed together as by spot welds 56, Figure 4. Preferably, the blank 45 is then telescoped over a split die 57, Figure 10. The split die 57 is then expanded to bring the blank 45 from its oval shape into the preferred elliptical shape of the now finished arrester cup 26.

While the invention has been described with much detail, it is believed that it in essence comprises a generally elliptical dust arrester cup having an outwardly projecting lip with an inwardly projecting top wall forming a dust skimmer.

Although the invention has been described in its preferred form with a certain degree of particularity, it is understood that the present disclosure of the preferred form has been made only by way of example and that numerous changes in the details of construction and the combination and arrangement of parts may be resorted to without departing from the spirit and the scope of the invention as hereinafter claimed.

I claim:

1. A dust arrester cup comprising a thin walled member having an oval shaped transverse cross section, the member having generally parallel top and bottom ends and a smooth walled central portion therebetween, said smooth walled central portion defining a passage of oval shaped cross section, the bottom end including flange means for connecting the cup to a base plate with the cup projecting through an aperture in the plate, said cup having a peripherally extending bag retaining lip projecting outwardly and congruently from the contour generated by said central portion, said lip including an endless dust deflecting side wall projecting inwardly from said lip, said endless side wall being at said top end and including an endless deflection portion extending into the passage, and said central and deflection portions being congruent.

2. The device of claim 1 wherein the deflection portion extends inwardly and downwardly in the passage.

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