A structure is attached to a conventional mower or other machine that normally discharges a stream of high-velocity air with entrained particles such as grass clippings or chopped leaves. This structure supports a standard refuse bag on a frame receivable into the mouth of the bag, which is secured to the frame by a constricting tie surrounding the bag and the frame periphery. The bag is additionally supported on the inside by a normally horizontal member secured to the frame.

3 Claims, 7 Drawing Figures
PARTICLE-COLLECTING DEVICE

BACKGROUND OF THE INVENTION

Mowing and leaf-chopping machines usually discharge a large quantity of particles entrained in a high-velocity stream of air. These particles are usually accumulated in bags, which function as filters permitting the air stream to pass through the bag, while retaining the entrained particles within the bag for subsequent disposal. These air-permeable bags are usually emptied into disposable bags or other containers, and replaced on the machine. The general purpose of the present invention is to provide an arrangement for using large standard non-permeable bags and supporting them adequately so that the full capacity of these bags may be utilized without the necessity of repeated emptying of the conventional smaller filter bags.

SUMMARY OF THE INVENTION

A support structure for bags of non-permeable material includes a frame normally secured in a generally vertical plane to a machine discharging particles entrained in a high-velocity stream of air. The frame has an opening registering with the exhaust of the machine. The periphery of the frame is receivable within the mouth of a conventional trash bag, which secured to the frame by a constricting tie surrounding the bag and the frame periphery. A screened opening in the frame provides for exhaust of the air stream, retaining the entrained particles within the bag. An auxiliary support for the bag is provided by a member extending within the bag, preferably of a "U"-shaped configuration, with the ends of this member traversing the plane of the frame and received telescopically in tubular bracing extending from the upper portion of the frame downward to points of connection to the body structure of the primary machine.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a machine equipped with a collecting device embodying the invention.

FIG. 2 is a perspective view on an enlarged scale over that of FIG. 1, showing the supporting frame and its mounting on the body structure of the machine. The exhaust screen is shown removed from the frame.

FIG. 3 is a perspective view of the opposite side of the structure shown in FIG. 2, on a reduced scale.

FIG. 4 is an enlarged fragmentary sectional elevation at the juncture of the frame, the frame bracing, and the bag-supporting member.

FIG. 5 is a fragmentary sectional elevation on the scale of FIG. 4 taken on a vertical plane adjacent the bottom of the frame.

FIG. 6 illustrates a leaf-chopping machine equipped with a collecting device operating on the principles of the structure shown in FIGS. 1 through 5.

FIG. 7 is a sectional elevation of the machine shown in FIG. 6.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

FIGS. 1, 2, and 3 illustrate a conventional lawn-mowing machine generally indicated at 10 equipped with a collecting device embodying the present invention. The motor 11 of this machine rotates a blade rapidly on a vertical axis, generating not only a cutting action, but also functioning as a centrifugal blower discharging a stream of air tangentially through the duct 12 during its normal operation. Grass clippings entrained in the stream of air emerging from this exhaust duct are collected within the bag 13. The opening of this bag is receivable over the periphery of the frame 14, which has an opening registering with the exhaust duct 12 of the machine. The frame is preferably secured to flanges of the type shown at 15-18 in FIG. 3, which are preferably integral with the exhaust duct 12. In many standard forms of mowing machine, the exhaust duct 12 should be provided as an extension on an opening of similar shape in the body structure of the machine, the extension being desirable for placement of the frame 14 in proper clearance relationship with the wheels 19 and 20.

The frame 14 is additionally supported by the braces 21 and 22, which are preferably tubes received at their lower ends in sockets as shown at 23 secured to the body structure of the machine. The opposite ends of these braces are secured to the frame 14 as shown in FIG. 4. Conventional tube fittings as shown at 24 traverse the frame 14, which is preferably a panel of plywood or some other convenient material. Tightening of the nut 25 has the effect of applying a gripping action to the tubular brace, which additionally applies a gripping action to the "U"-shaped bag-support 26 received telescopically in the open ends of the tubular braces 21 and 22. The bag 13 is received over the "U"-shaped member 26, which holds the bag out in the position shown in FIG. 1. The opening 27 of the frame is covered by the screen 28, which can be secured to the frame in any convenient fashion such as setting it into a recess 27a in the opening 27 in the frame, with the ledge 28a on the screen hooked over the bottom of the opening 27. A screw or latch (not shown) should be located along the top of the screen. It is preferable that the screen be removable for periodic cleaning.

The bag is secured to the periphery of the frame at the groove 29, the material of the bag being forced into the groove by the presence of the constricting tie 30. (Refer to FIG. 4.) Referring to FIG. 5, the lower portion of the frame is preferably offset upwardly from the lowest portion of the adjacent machine structure indicated at 31, or an auxiliary shield can be secured to the underside of the duct 12 at this point. The upward offset of the frame at this point shields the bag 13 from abrasion which would otherwise be likely as the machine is moved over the ground surface.

Referring to FIGS. 6 and 7, a leaf-mulching machine is indicated generally at 32. This machine is normally pushed over the surface of a lawn, and functions in the manner of a vacuum cleaner sucking leaves and other material up from the ground, chopping them, and discharging them into the collecting bag 33. The construction of the primary machine is conventional, and will usually include some form of motor 34 and combined blower-shredding means 35 driven through the belt 36 and mounted within the housing 37. The discharge duct 38 registers with the opening 39 in the bag-supporting frame 40, which is conveniently supported by fastenings at this point. An exhaust opening 41 in this frame is covered by a screen 42, and the bag 33 is secured to the frame 40 by the constraining tie 43 in the manner shown in FIG. 4. Particles entrained in the stream flowing through the exhaust duct 38 accumulate at the position shown at 44 within the bag 33, which is discarded when it becomes filled.
I claim:

1. Apparatus for collecting in a fluid impervious bag the debris discharged by a rotary lawn mower housing through the discharge opening of said mower housing, comprising:
   a frame panel having a first opening of substantially the same configuration as said discharge opening of said mower housing, a second larger opening, and a groove extending around the entire periphery of said panel, the length of the periphery of said panel being substantially equal to the circumference of the opening of said bag;
   mounting means securing said panel to said mower housing in a vertical position with said first opening of said panel in alignment with and immediately adjacent to said discharge opening of said mower housing;
   a screen secured to said panel and covering said second opening therein;
   a U-shaped support member secured at its ends to said frame panel adjacent the upper edge thereof and extending outwardly from said panel in a generally horizontal plane perpendicular thereto, said support member being adapted to be received in said fluid impervious bag, the width and length of said support member being substantially equal to the width and depth, respectively, of said bag; and a constricting tie adapted to encircle said bag when the open end thereof has been positioned over said panel, said tie forceably engaging the material of said bag in said groove of said panel.

2. A combination as defined in claim 1, additionally including tubular bracing means extending from the upper portion of said frame and normally connected to said mower housing.

3. A combination as defined in claim 2, wherein the ends of said “U”-shaped member traverse the plane of said frame, and are telescopically received in said tubular bracing means.