

[54] **SHREDDING AND BALING DEVICE**

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[22] Filed: **Jan. 12, 1970**

[21] Appl. No.: **2,133**

[52] U.S. Cl. **100/91, 55/100, 55/315, 55/372, 55/429, 55/466, 55/488, 100/97, 241/49**
[51] Int. Cl. **B30b 15/08**
[58] Field of Search 100/39, 90, 91, 94, 95, 96, 100/97, DIG. 14; 241/49, 60, 61; 209/38, 250; 55/100, 315, 372, 429, 466, 487, 488, 489

[56] **References Cited**

UNITED STATES PATENTS

1,116,777	11/1914	Williams	241/49 X
1,571,518	2/1926	Foster	241/49 X
2,012,250	8/1935	Rundell	241/49 X
2,059,229	11/1936	Gregg	100/39
2,237,978	4/1941	Wall	241/49
2,364,101	12/1944	Schurman	241/61 X
2,691,338	10/1954	Robbins	100/97

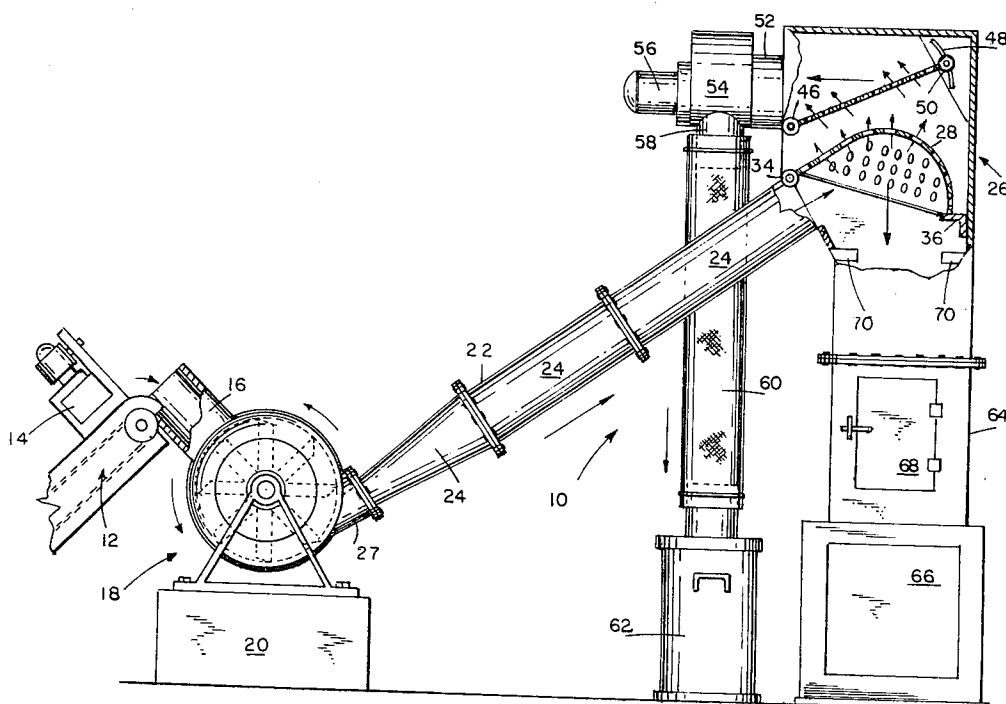
3,111,892	11/1963	Deems	100/90
3,189,286	6/1965	O'Connor	100/97 X
3,426,673	2/1969	Miner et al.	100/39 X

Primary Examiner—Billy J. Wilhite
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[57] **ABSTRACT**

A combination shredding and baling device comprising means for feeding paper, books, magazines and the like into the inlet conduit of a rotary shredding device, the outlet conduit of the shredding device is connected to a housing having vacuum-pumping means connected thereto in fluid flow communication with the outlet conduit, a pair of perforated screen members having elongated openings whose longitudinal axes are disposed substantially perpendicular to one another are positioned within said housing between the outlet conduit and the vacuum-pumping means, the housing includes an integrally formed vertically disposed passageway the upper portion of which is positioned beneath the screen members and the lower portion of which is connected to a baling device and the outlet of the vacuum-pumping means is connected to one end of a porous chute whose other end is secured to a refuse collection container.

10 Claims, 3 Drawing Figures



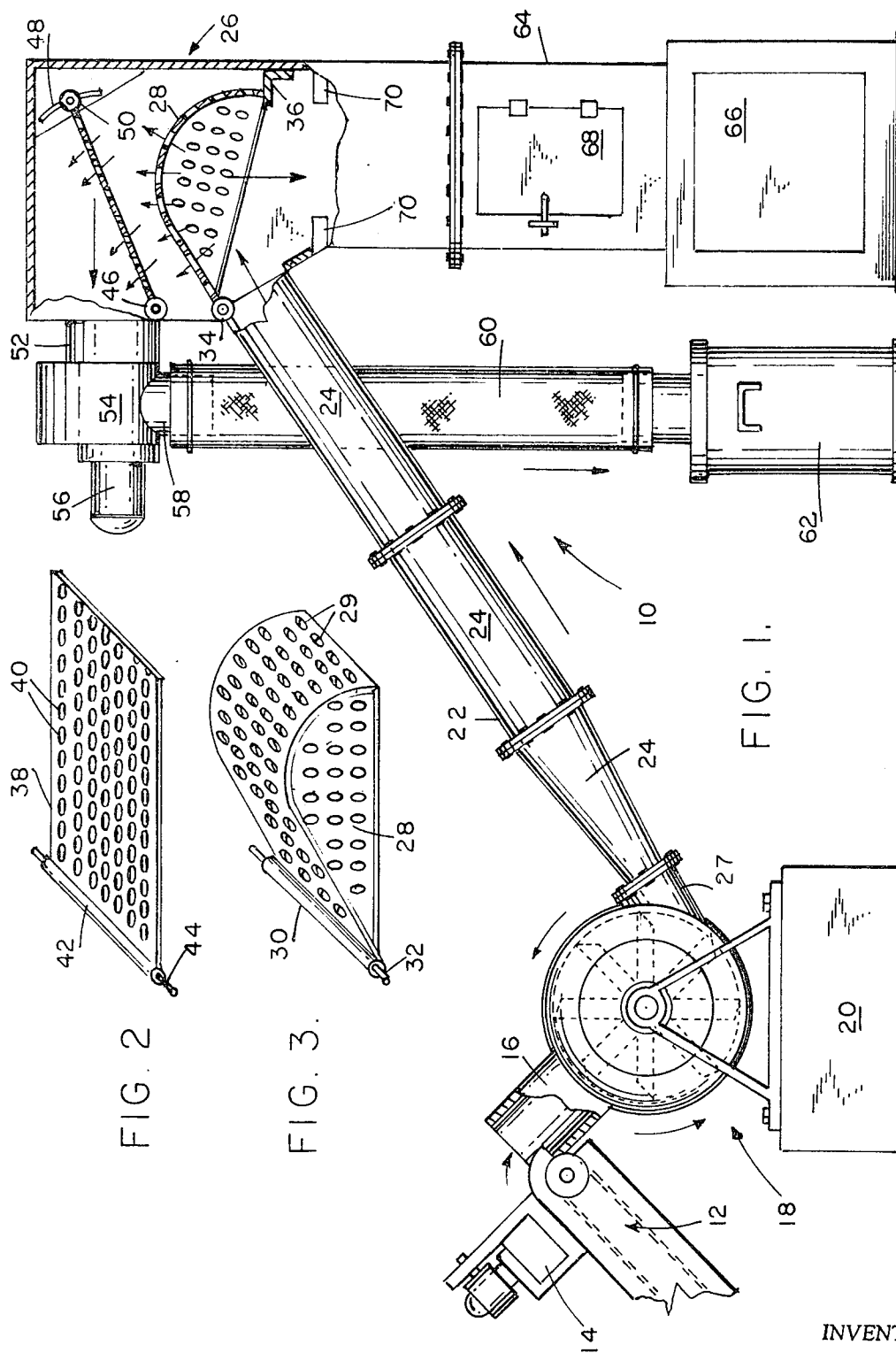


FIG. 2

FIG. 3.

FIG. 1.

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SHREDDING AND BALING DEVICE

BACKGROUND OF THE INVENTION

The present invention pertains to a new and novel combination shredding and baling apparatus which in a continuous operation shreds paper, books, magazines and the like into paper strips which, after the removal of small paper particles, dust and other debris, are deposited in a baling device for subsequent reprocessing and reuse.

SUMMARY OF THE INVENTION

Accordingly, it is the primary object of the present invention to provide a new and novel combination shredding and baling apparatus for paper and the like.

It is another object of the present invention to provide an apparatus as above including filter means for filtering the paper strips produced by the shredding operation to remove small particles, dust and other undesirable debris therefrom.

It is a further object of the present invention to provide an apparatus of the aforementioned type where the resultant paper strips are directly deposited in a baling device after filtering thereof.

It is yet another object of the present invention to provide an apparatus of the aforescribed type wherein the filter means includes first and second filter members having elongated openings therein.

It is still another object of the present invention to provide filter members, as above, wherein the first filter member is of a generally inverted cup-shaped configuration and the second member is of a flat configuration, and wherein the longitudinal axis of the openings in the inverted cup-shaped member are disposed substantially perpendicular with respect to longitudinal axis of the openings in the flat member.

It is yet a further object of the present invention to provide an apparatus of the aforementioned type, wherein there is provided a magnetic member interposed between the filter members and the baling device to prevent undesirable metallic members, such as staples, from reaching the baling device.

BRIEF DESCRIPTION OF THE DRAWINGS

The foregoing and other objects, features and advantages of the present invention will become more apparent from the detailed description hereinafter considered in conjunction with the accompanying drawing, wherein:

FIG. 1 is a front elevational view of a combination shredding and baling apparatus constructed in accordance with the principles of the present invention with a portion thereof being shown in section;

FIG. 2 is a perspective view of the flat filter member employed in the apparatus depicted in FIG. 1; and

FIG. 3 is a perspective view of the inverted cup-shaped filter member employed in the shredding and baling apparatus of FIG. 1.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings and, more particularly to FIG. 1 thereof, there is shown the combination shredding and baling apparatus of the present invention which is generally designated by the reference numeral 10. The apparatus 10 includes an endless belt type of conveyor 12 driven by means of a motor 14. The conveyor 12 carries paper, books, magazines and similar paper products to the inlet conduit 16 of a conventional rotary-type shredding device 18 which includes a mounting base 20 which contains driving means for operation of the shredding device 18.

The outlet conduit of the shredding device, generally denoted by the reference numeral 22, and comprising a plurality of connected sections 24, is connected to and opens into a housing 26. The section 24 directly connected to the device 18 is of inward-tapered configuration to provide a high-pressure area at the outlet 27 of the shredding device.

Pivotaly mounted within the housing is a first filter member 28 having a generally inverted cup-shaped configuration and also having a plurality of elongated openings 29 formed in the top and side walls thereof. As best seen in FIG. 3, the member 28 has a sleeve 30 formed at one end thereof within which is disposed a rod 32. The ends of the rod are journaled in bearings 34 to thereby permit pivotal movement of the filter member 28. The forward end of filter member 28 is held in supported engagement by means of a right-angle bracket 36 suitably secured to the inner surface of housing 26, such as by welding, which bracket also limits the pivotal movement of the filter member 28.

A second filter member 38 having a substantially flat configuration and a plurality of elongated openings 40 is also mounted within housing 26 and positioned above filter member 28. As best seen in FIG. 2, the member 38 has a sleeve 42 formed at one end thereof within which is a rod 44. The ends of rod 44 are journaled in bearings 46 to permit pivotal movement of the filter member 38. The forward end of member 38 is held in position by means of a support member (not shown) whose position is adjustable by means of an arcuate adjusting slot 48 and an adjusting screw 50.

Connected to the upper end of housing 26 is the inlet end 52 of a vacuum pump 54 operatively driven by means of a motor 56. The outlet end 58 of the pump is securely connected to one end of an air-pervious chute 60 which, by way of example, may be fabricated of a canvas material. The other end of the chute 60 is securely connected to the inlet end of a refuse container 62.

Depending from the housing 26 is an integrally formed passageway 64 which is connected at its lower end to a baling device, generally denoted by the reference numeral 66. The passageway 64 which herein is generally of annular configuration, includes an entrance door 68 which provides access to the baling device 66.

In the operation of the apparatus 10, paper, books and the like are carried by the conveyor 12 to the inlet conduit 16 and deposited therein and fed to the rotary shredding device 18 which shreds the material fed therein into relatively thin paper strips. The rotational movement of the blades 70 (shown in phantom) of the shredding device 18 causes the formation of a low-pressure area at the inner end of inlet tube 16 and forms an increased pressure area at the inner end of the outlet conduit 22, much in the same manner as a rotary pump. This pressure differential causes the material to be sucked into the inlet conduit 16 and to be forced outwardly, after shredding, into the outlet conduit 22.

The vacuum provided to the housing 26 at the inlet end 52 of the vacuum pump 54 is also present at the outer end of the outlet conduit 22 and in conjunction with the increased pressure at the inner end of the outlet conduit, permits the shredded paper strips to pass upwardly through conduit 22 into housing 26.

Attention is directed to the fact that the longitudinal axes of the elongated openings 29 in the top and sidewalls of filter member 28 are in linear and parallel alignment. Similarly, the longitudinal axes of the elongated openings 40 in the filter member 38 are in linear and parallel alignment. However, the longitudinal axis of the openings 29 and 40 are disposed in substantially perpendicular relationship with one another. In a preferred embodiment of the invention the openings 40 are made somewhat smaller than those of openings 29, the purpose of which will now be described in detail.

The shredded paper strips of significant size in the housing 26 will pass downwardly into passageway 64 and then into the baling device 66. Other ones of the paper strips will pass upwardly into the interior of filter member 28 due to the vacuum present in housing 26 by virtue of the vacuum pumps 54, and if too large to pass through the openings 29 therein will also drop downwardly into the passageway 64. Those paper strips of smaller size will pass through the openings 29 in the top and sidewalls of member 28 and present themselves at the bottom surface of the filter member 38 where the longitudinal axes of

openings 40 are perpendicular to those of openings 29 through which the last-mentioned strips had passed. Thus, if the size of these strips is significant they will be unable to pass through openings 40 and will tend to fall downwardly past the sides of member 28 and then into passageway 64.

The parties and strips which are small enough to egress through both openings 29 and 40, which will include small particles of paper, dust and other small sized debris, will flow into the vacuum pump inlet 52 and through the pump 54 into the outlet 58 and then downwardly through the chute 60 into the refuse container 62.

As discussed hereinbefore, the chute 60 is fabricated of an air-pervious material, such as a canvas, whereby the pressurized air appearing at outlet terminal 58 is permitted to diffuse outwardly therefrom, while the small sized particles of debris and dust pass therethrough into container 62.

It will be apparent that in the shredding of books and magazines, for example, some of the undesirable particles presented in housing 26 will be metal, such as staples. While some of these small metal particles will tend to pass through the filter members 28 and 38, and thus be deposited in container 62, other ones of these metallic particles will pass directly downwardly into passageway 64 and ultimately into baling device 66. In order to prevent the particles from passing through passageway 64, the same may be provided with internally positioned magnetic members 70 which will attract the metallic particles and prevent the same from entering the baling device.

While I have shown and described the preferred embodiments of my invention, it will be readily apparent to those skilled in the art that there are many changes, modifications and improvements which may be made therein without departing from the spirit and scope of the invention.

What is claimed is:

1. A combination shredding and baling apparatus comprising
 - a shredding device,
 - a baling device,
 - said shredding device including inlet means, and outlet means,
 - means for feeding paper products to be shredded to said inlet means;
 - an enclosed housing,
 - an outlet conduit having one end thereof connected to said outlet means and the other end thereof connected to said housing in flow communication therewith,
 - vacuum-pumping means connected to said housing in flow communication therewith,
 - filter means disposed within said housing positioned between said other end of said outlet conduit and said vacuum-pumping means,
 - a passageway interconnected between said housing and said baling device,
 - said vacuum-pumping means including an outlet,
 - a refuse container,
 - an air-pervious member interconnected between said pumping means outlet and said refuse container,
 - said filter means including first and second filter members,
 - said first filter member being disposed in proximal relationship to said other end of said outlet conduit,
 - said second filter member being disposed between said first filter member and said vacuum-pumping means,
 - said first filter member including a generally inverted cup-shaped configuration, and
 - said second filter member including a substantially flat configuration.
2. An apparatus in accordance with claim 1, wherein said first and second filter members each has a plurality of

elongated openings therein, and the longitudinal axes of said elongated openings in said first member being disposed substantially perpendicular to the longitudinal axes of said elongated openings in said second member.

3. An apparatus in accordance with claim 2, wherein said air-pervious member is fabricated of canvas.

4. An apparatus in accordance with claim 2, wherein said passageway includes at least one magnetic member disposed therewithin and secured thereto.

5. An apparatus in accordance with claim 2, wherein said shredding device is of the rotary type.

6. An apparatus in accordance with claim 2, wherein said passageway includes a door for providing access to said baling device.

7. A combination shredding and baling apparatus comprising
 - a shredding device,
 - a baling device,
 - said shredding device including inlet means, and outlet means,
 - means for feeding paper products to be shredded to said inlet means,
 - an enclosed housing,
 - an outlet conduit having one end thereof connected to said outlet means and the other end thereof connected to said housing in flow communication therewith,
 - vacuum-pumping means connected to said housing in flow communication therewith,
 - first and second filter means disposed within said housing positioned between said other end of said outlet conduit and said vacuum-pumping means,
 - a passageway interconnected between said housing and said baling device,
 - said vacuum-pumping means including an outlet,
 - a refuse container,
 - an air-pervious member interconnected between said pumping means outlet and said refuse container,
 - said first filter means being disposed in proximal relationship to said other end of said outlet conduit with said first filter means being extended across flow communication paths between said vacuum-pumping means on one side thereof and both said outlet conduit and said baling device on an opposite side thereof for directing material larger than a predetermined size from said outlet conduit towards said baling device and away from said vacuum-pumping means,
 - said second filter means being disposed between said first filter means and said vacuum-pumping means, and
 - said second filter means being a different configuration from said first filter means for directing material of a preselected size smaller than said predetermined size away from said vacuum-pumping means towards said baling device.
8. An apparatus in accordance with claim 7, wherein said first filter means includes a generally inverted cup-shaped configuration.
9. An apparatus in accordance with claim 7, wherein said first and second filter means each includes a plurality of elongated openings therein, and the longitudinal axes of said elongated openings in said first filter means being disposed substantially perpendicular to the longitudinal axes of said elongated openings in said second filter means.
10. An apparatus in accordance with claim 7, wherein said passageway includes at least one magnetic member disposed therewithin and secured thereto.

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