

Aug. 29, 1967

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3,338,405

PANELS FOR PACKAGING BLOWERS

Filed Oct. 21, 1965

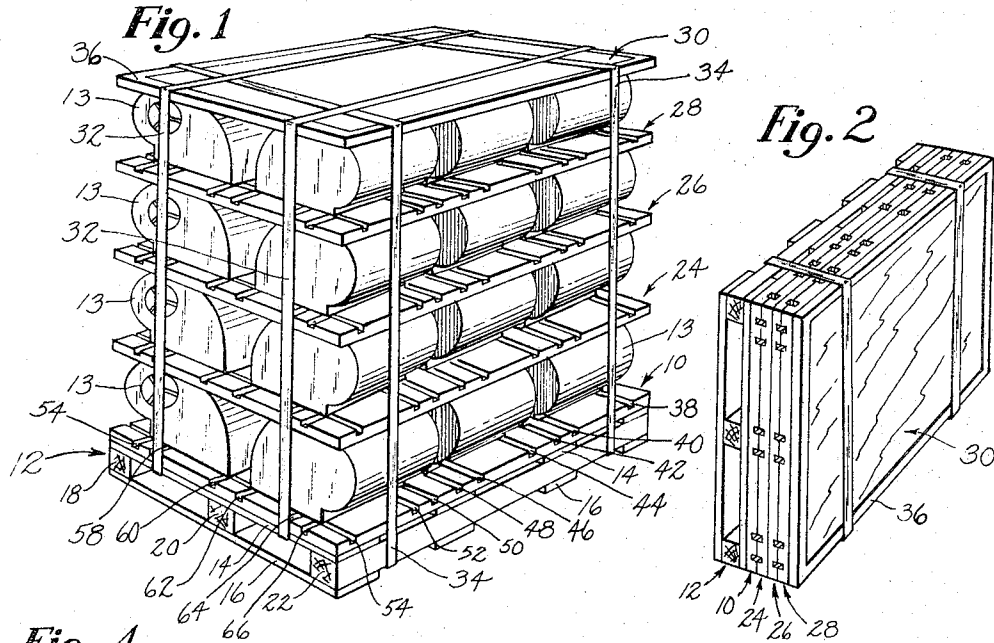


Fig. 4

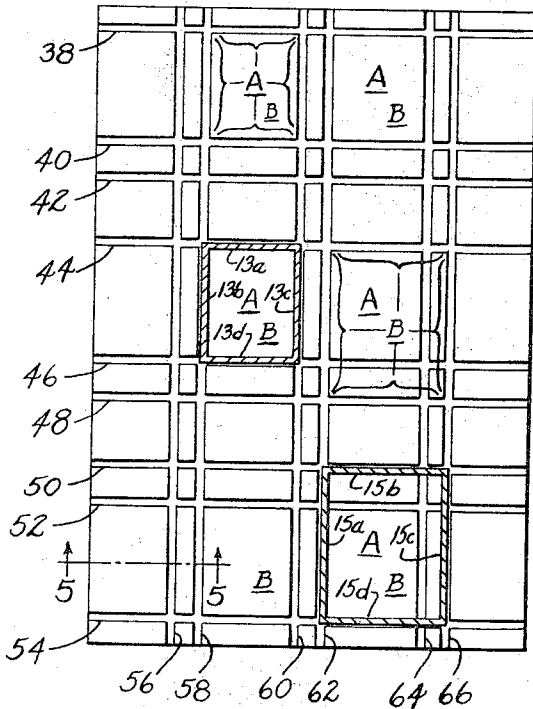


Fig. 3

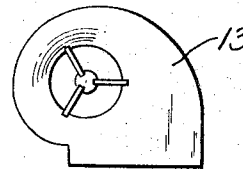


Fig. 5

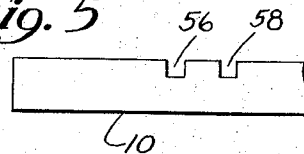
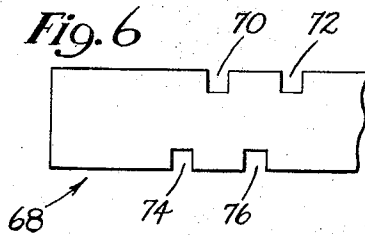


Fig. 6



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PANELS FOR PACKAGING BLOWERS

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Filed Oct. 21, 1965, Ser. No. 499,148

7 Claims. (Cl. 206-65)

This invention relates to panels for use in securing together and transporting a plurality of blowers each with a volute shaped casing or housing which has a discharge or outlet opening defined by connected rectangularly arranged housing walls. As illustrated in U.S. Patent 3,137,388 entitled, "Shipping Apparatus," issued to R. L. Strouth on June 16, 1964, blowers of the type mentioned can readily be arranged in a plurality of horizontal layers in a vertical stack with vertically spaced horizontal pallets or panels disposed between adjacent layers of blowers and in engagement therewith. With such an arrangement, large numbers of blowers can be secured together and handled conveniently for shipping, storage, etc. When blowers are so arranged and packaged and shipped to a customer, the individual panels can be bound together after the blowers have been removed and the panels can be conveniently returned to the manufacturer.

While the packaging of blowers in the manner described has been generally satisfactory, certain disadvantages have been encountered. The panels employed in securing the blowers in layers and in a vertical stack have been characterized by small anchor blocks receivable within the rectangularly arranged housing outlet walls and engageable with the walls to restrain the blowers against horizontal movement. Such blocks tend to become dislodged with continuous and hard use as is encountered in shipping departments and, moreover, the manufacture of the panels requires that a multitude of blocks be nailed, screwed or otherwise secured in precise location on the panels. Such a manufacturing technique is quite obviously lacking in economic advantage.

It is the general object of the present invention to provide an improved packaging panel of the type mentioned which panel can be manufactured at economic advantage, and which exhibits a high degree of dependability and durability in use.

The drawings show preferred embodiments of the invention and such embodiments will be described, but it will be understood that various changes may be made from the constructions disclosed, and that the drawings and description are not to be construed as defining or limiting the scope of the invention, the claims forming a part of this specification being relied upon for that purpose.

Of the drawings:

FIG. 1 is a perspective view of a package comprising several panels of the invention and several layers of blowers.

FIG. 2 is a perspective view of the panels arranged for return shipment to the manufacturer.

FIG. 3 is a side view of a typical blower adapted to be secured and transported by the panels of the invention.

FIG. 4 is a plan view of a base panel and includes a sectional view of the housing outlet walls of blowers of two different sizes in position on the panel.

FIG. 5 is a fragmentary section taken generally as indicated at 5-5 in FIG. 4.

FIG. 6 is a fragmentary section similar to FIG. 5, but showing an alternative embodiment of the invention.

Referring particularly to FIG. 1 of the drawings, it will be observed that a base panel 10 is disposed above a conventional skid 12. The skid 12 comprises upper and lower panels 14, 16 and stiffening and support members

18, 20, 22. Six blowers 13, 13 are disposed above the base panel 10 and beneath a first or lowermost intermediate panel 24. Similarly, six blowers are disposed above and beneath a central intermediate panel 26 and six additional blowers are disposed above an uppermost intermediate panel 28 and beneath a top panel 30. Metal bands 32, 32 and 34, 34 are secured about the package in perpendicular relationship with each other to hold the package together in integral form. When so secured, the package may be raised and lowered in the usual manner by means of a fork lift truck or other device and a high degree of convenience in storing and in transport is achieved.

When a package of blowers has been received by a customer of the blower manufacturer, the bands 32, 32 and 34, 34 are of course removed in the usual manner whereupon the blowers can be readily removed from the package lifting the panels 10, 24, 26, 28 and 30 one at a time and in reverse order. After the last blower has been taken from the package, the several panels, together with the skid 12, can be conveniently nested and secured together in the manner illustrated in FIG. 3. Thus a compact assembly is provided for return shipment to the blower manufacturer.

In accordance with the invention, the panels 10, 24, 26, 28 and 30 may be identical, but they are preferably manufactured with the intermediate panels 24, 26 and 28 identical and with the base panel 10 of a slightly heavier construction. That is, the intermediate panels 24, 26 and 28 are preferably formed of 5/8 inch thick plywood while the base panel 10 is preferably formed from a 3/4 inch thick plywood sheet. The top panel 30 may be formed of a lighter weight plywood and need not include grooves to be described hereinbelow for securing blowers in position. Further, a steel edge member 36 is preferably provided along a marginal portion of the top panel 30.

Referring particularly to FIG. 4, the base panel 10 is shown with a grooved upper surface and it will be understood that each of the intermediate panels 24, 26 and 28 carries a similar groove pattern on its upper surface, the blowers 13, 13 being arranged in the package shown with their housing outlet portions opening vertically downwardly.

In accordance with the invention, the panel 10 and each of the panels 24, 26 and 28 include first and second right angularly related and intersecting series of narrow spaced apart parallel grooves. Thus, on the upper surface of panel 10 as shown in FIG. 4, a first series of grooves includes parallel horizontally extending grooves 38, 40, 42, 44, 46, 48, 50, 52 and 54. A second series of grooves, extending vertically and intersecting at right angles the first series of grooves, comprises the grooves 56, 58, 60, 62, 64 and 66. Preferably, and as shown, each of the grooves 38 through 54 of the first or horizontal series, and each of the grooves 56 through 66 of the second or vertical series is linear and extends from one to an opposite edge of the panel 10. Thus, it will be apparent that all of the grooves can be provided with a high degree of ease and convenience in manufacture. It is necessary merely to pass the plywood over a conventional table saw properly adjusted as to height in order to groove a surface as required. The grooves 38 through 66 in FIG. 4 are relatively narrow so as to receive and hold edge portions of outlet housing walls in a manner to be described. The width of the grooves is approximately 3/16 of an inch and the depth thereof approximately 1/4 of an inch.

As will be apparent in FIG. 4, the first and second or horizontal and vertical series of grooves are so arranged with respect to each other as to provide a plurality of discrete recessed blower seats each of which comprises four connecting rectangularly related groove sections. Referring to the seat A at the upper left-hand corner of

the panel 10, it will be observed that the said seat comprises sections A, A of each of the grooves 38, 40, 58 and 60, as indicated by the respective brackets. Further, five additional recessed blower seats A, A are provided by intersecting and connecting groove sections. Each of the seats A, A is adapted to receive the edge portions of the rectangularly arranged housing walls of a blower 13 at the blower outlet opening as illustrated at the intermediate left-hand seat A where such housing edge portions are shown at 13a, 13b, 13c and 13d.

As shown, six recessed blower seats B, B are also provided by the grooves 38 through 66 of the first and second or horizontal and vertical series. The seats B, B are at least partially in registry with but are not coextensive with the seats A, A. That is, groove sections which form the seats A, A are also employed in forming the seats B, B, but the seats B, B are somewhat larger than the seats A, A and additional sections of the several grooves are therefore employed in forming the latter seats. Referring particularly to the intermediate seat B at the right-hand portion of the panel 10, it will be seen that the brackets B, B set out sections of the grooves 44, 48 and 62, 66 forming the seat. Similarly, the remaining seats B, B are formed by groove sections which may also be employed in formation of the seats A, A, but additional groove sections are utilized for the latter seats.

The lowermost right-hand seat B is shown with edge portions of a blower housing received therein. Thus, a blower 15, not shown, but somewhat larger than the blowers 13, 13 may have housing edge portions a, b, c, d adjacent its outlet opening. The said housing edge portions can be conveniently received in the sheets B, B as illustrated.

With regard to both the seats A, A and B, B, it is to be noted that the width of the groove sections forming the seats is only slightly greater than the thickness of the edge portions of the blower housings received therein. Thus, the blowers are securely held against horizontal displacement when the edge portions of their outlet housings are entered in the seats and when an additional panel is disposed above the blower so as to urge the same downwardly. Ordinarily, blowers of the same size are employed at least throughout a layer of blowers in a package, but it is of course possible to accommodate blowers of varying size in a single layer where the blower height is constant.

Referring now particularly to FIG. 5, it will be observed that a panel 68 shown partially therein is somewhat heavier in construction than the aforementioned panels. Said panel may be approximately 1 inch or slightly greater in thickness so as to be provided conveniently with grooves on both upper and lower surfaces thereof. Thus, the grooves 70, 72 may be provided in the upper surface thereof in a manner similar to the aforementioned grooves 56, 58 and, moreover, the upper surface of the said panel may be provided throughout with grooves in a manner identical with the provision of the aforesaid grooves 38 through 66. On the lower surface of the panel 68 there are shown grooves 74 and 76. The grooves 74 and 76 form a part of a vertical series of grooves spaced somewhat differently from the aforementioned grooves 56 through 66. Similarly, the lower surface of the panel 68 can be provided with a horizontal series of grooves corresponding to the grooves 38 through 52 but spaced apart vertically in a somewhat different manner. With first and second or horizontal and vertical series of grooves provided on the lower surface of the panel 68, it will be apparent that twelve additional recessed seats such as the seats A, A and B, B can be provided merely by reversing the position of the panel. Preferably, the

seats formed on the lower surface of a panel such as the panel 68 vary in dimension with respect to the aforementioned seats A, A and B, B so that four different sizes of blowers can be accommodated by a plurality of panels 68, 68. Thus, a high degree of versatility can be provided for with the panels of the present invention.

From the foregoing it will be apparent that the panels of the present invention combine an economic advantage in manufacture with desirably durable and dependable construction to a degree which has heretofore been unattainable. Further, the panels are well adapted to compact nesting in return shipment to a blower manufacturer and they exhibit a high degree of versatility in use.

The invention claimed is:

1. A plurality of packaging panels for use in securing together and transporting a plurality of blowers arranged in horizontal layers in a vertical stack wherein each layer comprises a plurality of blowers similarly oriented and similarly held between vertically spaced horizontal panels and wherein each blower has a housing with a vertically open outlet duct defined by connected rectangularly arranged housing walls, each said panel comprising a substantially rigid member with flat upper and lower surfaces adapted respectively to engage lower and upper surfaces of blowers when the panel is disposed between vertically adjacent layers of blowers in a stack as aforesaid, at least one of said flat upper and lower panel surfaces having first and second right angularly related and intersecting series of narrow spaced apart parallel linear grooves therein, at least one of said series of grooves comprising at least four spaced apart parallel grooves whereby to provide in cooperation with the grooves of the other series at least two discrete recessed blower seats each comprising four connecting rectangularly related groove sections and each adapted to receive the edge portions of the rectangularly arranged housing walls of a blower, each of said grooves having a width slightly greater than the thickness of said edge portions of the rectangularly arranged housing walls of the blowers.

2. A plurality of packaging panels as set forth in claim 1 wherein each of said grooves extends from one to an opposite edge of its corresponding panel.

3. A plurality of packaging panels as set forth in claim 1 wherein the recessed rectangular seats provided by the grooves are of at least two different dimensions.

4. A plurality of packaging panels as set forth in claim 1 wherein each of said upper and lower panel surfaces on each panel is provided with first and second series of grooves as described.

5. A plurality of packaging panels as set forth in claim 4 wherein the recessed rectangular seats provided on said upper panel surface differ in dimension with respect to the recessed seats on said lower panel surface.

6. A plurality of packaging panels as set forth in claim 1 wherein at least four recessed rectangular seats are provided by said grooves.

7. A plurality of packaging panels as set forth in claim 1 wherein said other series of grooves comprises at least three grooves whereby to provide at least four seats and at least two different seat sizes on said panel surface.

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