June 16, 1964 R. L. STROUTH 3,137,388

SHIPPING APPARATUS

Filed June 14, 1963

FIG-1

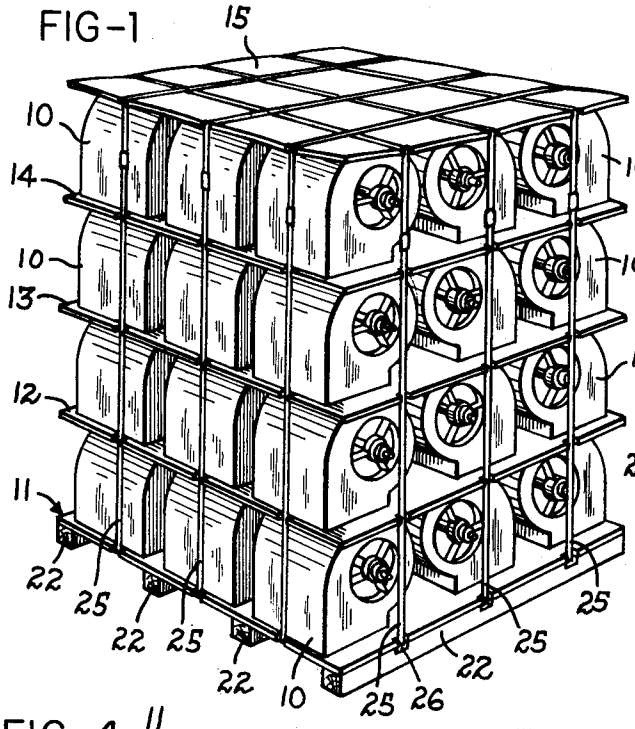


FIG-2

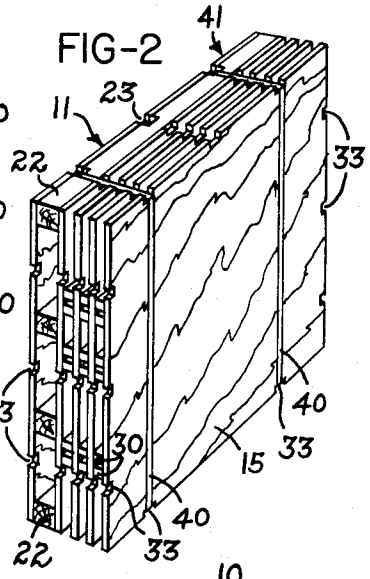


FIG-3

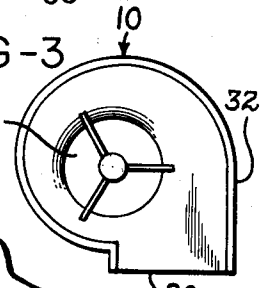


FIG-4

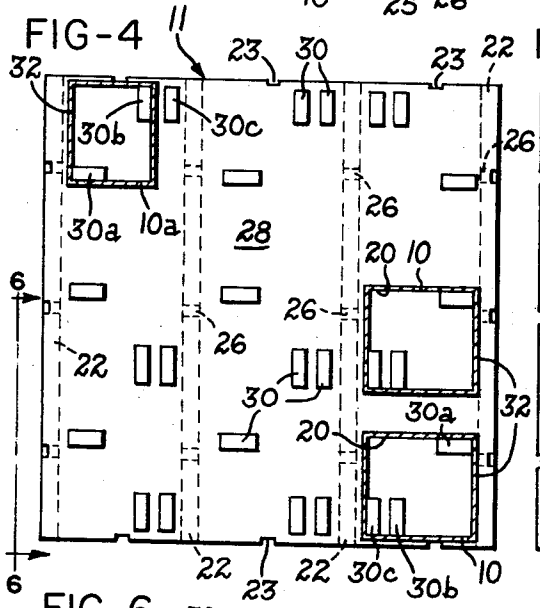


FIG-5

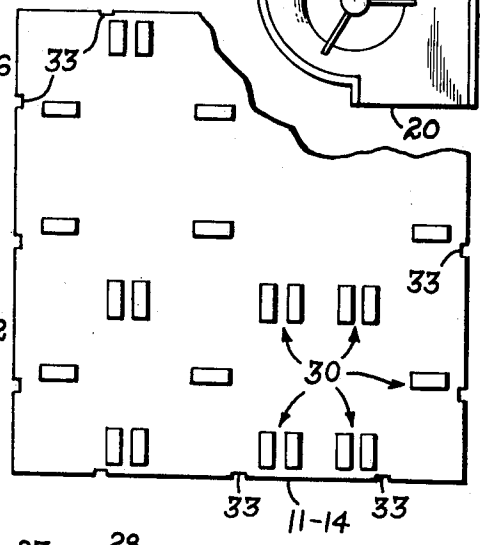
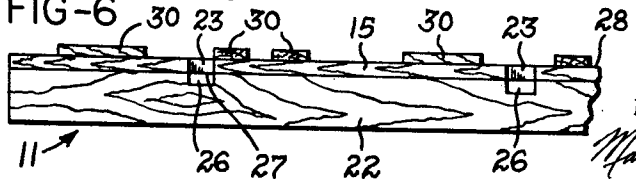


FIG-6



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3,137,388

SHIPPING APPARATUS

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3 Claims. (Cl. 206—65)

This invention relates to the handling of fans of the type generally known as blowers, and particularly to palletizing apparatus for use in shipping large numbers of such blowers.

A common practice in shipping blowers having a volute shaped scroll or casing is to pack each individual blower in a separate corrugated cardboard box with suitable cushions and partitions therein for holding the unwieldly shape solidly within the box. As a result, the blower manufacturer encounters the problems of handling the cardboard boxes, including different sizes for different capacity blowers, thus increasing the time required to pack and handle the boxes with an ultimate increase in the cost of the blowers. On the other hand, a purchaser of a large number of such blowers is presented with the problem of disposing of a large number of these boxes since it is not economically feasible to return or otherwise to salvage them.

Accordingly, it is a principal object of this invention to provide apparatus for inexpensively shipping a large number of blowers in such a manner that the time and expense associated with the packing and unpacking of the blowers, as well as the handling of the shipping apparatus, are decreased considerably below those of the previous practice in the industry.

Another object of this invention is to provide palletizing apparatus for shipping volute shaped blowers which is returnable and reusable, which provides open sides for the display of the blowers, and which can easily handle blowers of different sizes so that the manufacturer no longer is required to stock boxes corresponding to each size blower being manufactured.

A further object of this invention is to provide palletizing apparatus for shipping blowers having an unwieldy volute shape wherein the apparatus is inexpensive to manufacture, maintain and handle, and can be utilized for an indefinite number of shipments, and particularly to provide apparatus of the aforesaid type which when assembled forms a rigid package capable of being stacked and handled with ease.

Other objects and advantages of the invention will be apparent from the following description, the accompanying drawings and the appended claims.

In the drawing—

FIG. 1 is a perspective view of a pallet assembly in accordance with the invention;

FIG. 2 is also a perspective view of the pallet assembly assembled for shipment back to the manufacturer;

FIG. 3 is a side view of a typical blower which is handled by the invention;

FIG. 4 is a plan view of the base panel indicating the manner in which the blower outlets are held thereon;

FIG. 5 is a view similar to FIG. 3 illustrating an intermediate panel; and

FIG. 6 is an enlarged fragmentary view taken along the view line 6—6 of FIG. 4.

Referring to the drawing wherein a preferred embodiment of the invention is illustrated, apparatus in FIG. 1 for handling the blowers **10** includes the base panel **11**, the intermediate panels **12**, **13** and **14**, and the top or cover panel **15** all of which have essentially an identical outer configuration and size. The blowers **10** have volute or spiral shaped casings as required to

obtain maximum operational efficiency, as is well known to those skilled in the art and as shown in FIG. 3, and each casing has an inlet **19** at one or both sides thereof through which air is drawn by a suitable blower wheel, not shown, which forces the air through a rectangular outlet **20** which extends outwardly from the casing.

The base panel **11** is constructed of suitable sheet material, for example marine plywood, having four rails **22** on the bottom side thereof for holding this panel above ground level so that the forks of a lift truck can be inserted thereunder. Each edge of the base panel **11** is provided with notches **23** cut therein for accommodating the steel bands or straps **25** which are used to tie the various components of the assembly together, and the rails **22** similarly have aligned notches **26** cut therein so that the bands **25** extend directly adjacent the bottom surface **27** of the base panel **11**.

On the top surface **28** of the base panel **11** are secured a pluralty of cleats or guide blocks **30** which are utilized to engage the outlet opening **20** of each blower **10** for holding the same against movement parallel with the plane of the panel. As shown in FIG. 4, the blocks **30** are arranged in groupings or sets of three with each set including a base block **30*a***, which engages one corner of the outlet opening **20**, and the anchor blocks **30*b***, and **30*c***, one of which engages the opposite corner of the opening **20** depending on the size of this opening. Thus in FIG. 4, the outlet opening of the larger blower **10** is held against movement on the panel **11** by the blocks **30*a*** and **30*c***, whereas the smaller blower **10*a*** is held by the blocks **30*a*** and **30*b***. The number of anchor blocks therefore determines the number of different sized blowers which be handled by the panels, and while two such blocks have been shown, a larger number could be utilized without departing from the scope of the invention.

The blocks **30** are preferably strips of wood which are suitably secured to the base panel **11**, and the number of sets thereon determines the number of blowers **10** which can be handled by this panel. Similarly, the arrangement and spacing of the sets on the panels determine the relative spacing of the blowers **10** from the edges of the panels and from each other when the blowers are mounted thereon. As shown in FIG. 4, there are nine sets of guide blocks **30** on the base **11** so that this panel can hold nine blowers **10**, although the panel **11** could be enlarged or decreased in size for accommodating a larger or smaller number of blowers. The various sets of blocks **30** are arranged on the panel **11** so that the back sides **32** of the blowers **10** are positioned nearest the adjacent panel edge.

The intermediate panels **12**, **13** and **14** are essentially identical to the base panel **11** with the exception that the intermediate panels do not have the support rails **22**. Thus each intermediate panel has the notches **33** provided in the outer periphery thereof for receiving the steel bands **25**, and the sets of guide blocks **30** are arranged thereon as shown in FIG. 5 in essentially the same manner as on the base panel **11**. The cover panel **15** is used as the uppermost panel in the assembly and has an outer size and configuration also identical to the base and intermediate panels **11–14** although it does not have the guide blocks **30** thereon since it is utilized for clamping the uppermost level of blowers **10** in position on the panel **14**. The panels **12–15** are preferably constructed of material similar in composition and thickness to that used in the base panel **11**, although it might be desirable in some instances to make the cover and base panels **11** and **15** heavier than the intermediate panels **12–14**.

To assemble the pallet assembly, it is merely necessary to place blowers on each of the sets of guide blocks

30 on the base panel 11 in the manner explained above so that their outlet openings 20 are engaged by the guide blocks 30. Then the first intermediate panel 12 is placed on the top of the first level of blowers, as shown in FIG. 1, and filled.

This process continues until the desired number of levels of blowers is achieved, at which time the cover panel 15 is placed on the uppermost level and the entire assembly is locked essentially into an integral unit by tightly wrapping the steel bands 25 therearound in the notches 23 and 33 which prohibit sliding of the steel bands 25 along the edges of the various panel members. The ends of bands 25 are secured together in the conventional manner, and it is desirable to place the center bands on the assembly before the bands on either side thereof to decrease the possibility of misalignment of the panels during assembly.

Once all the bands 25 are in place, the assembly can be easily moved by fork truck to the rail car or the like which is to ship the blowers. Thus in this assembled condition, each of the blowers 10 is sandwiched between two of the panels 11–15 so that it cannot move vertically, and the guide blocks 30 prohibit any horizontal movement so that each blower is securely held in a position spaced from each other and from the edges of the associated panels.

When the pallet assembly arrives at its destination, the steel bands 25 are cut in a conventional manner, and the cover 15 is removed to expose the top layer of blowers 10. As each level of blowers is removed, the next intermediate panel is removed to expose another layer, and in this manner the entire assembly is disassembled. When all of blowers 10 have been removed therefrom, the panels 11–15 are tied together by the use of a steel band 40 which engages the notches 23 and 33 in the edge thereof as seen in FIG. 2. For return shipment, the base panel 11 can have its rails 22 positioned adjacent one of the intermediate panels 12–14 so that a smooth side is provided on each side of the composite package 41, or they can be utilized in a reverse position so that a fork lift truck can be utilized to move one or more of these packages 41.

While the above described embodiment of the invention is shown as utilizing panels which accommodate nine blowers, it is possible to increase or decrease this number by merely changing the size of the panel. The primary requirement is that the panels be of generally the same size and configuration so that they can easily be tied together and that the guide blocks 30 be provided on all panels except the cover 15. The notches 23 and 37 must be in at least the base and cover panels 11 and 15 so that the bands 40 will be held firm in place against slippage to provide an essentially rigid package of blowers which is easily handled as a unit.

The invention has thus provided returnable apparatus for shipping blowers which overcome the problems encountered heretofore with the use of cardboard boxes. Since any plurality of anchor blocks can be provided, the pallet structure can be utilized to ship blowers of many different sizes as explained above, and since the sides of the pallet assembly are open, the blowers are readily displayed for advertising and inspection purposes.

While the form of apparatus herein described constitutes a preferred embodiment of the invention, it is to be understood that the invention is not limited to this precise form of apparatus, and that changes may be made therein without departing from the scope of the invention which is defined in the appended claims.

What is claimed is:

1. A package of blowers of the character described comprising, a plurality of blowers each having a volute shaped housing with an outlet duct extending outwardly from said housing and terminating in a rectangular opening, a base panel, a plurality of substantially rigid flat intermediate panels, each of said panels having secured on

the top side thereof a plurality of aligned and correlated guide block sets, each said set having a base block and at least one anchor block spaced from said base block a distance equal to the distance between opposite corners of said rectangular openings, each said blower having its outlet duct extending downwardly against said top surface of one of said panels with the opposite corners of said openings being engaged by said base and anchor blocks of one of said sets for positioning and holding said blowers in spaced relation to each other and to the edges of said panels and against transverse movement with respect to the plane of said top side, said panels being positioned vertically above one another so that the lower sides of said intermediate panels engage said volute shaped housings opposite said outlet ducts on said blowers on the panel immediately therebelow to hold said blowers against movement in a direction perpendicular to said panels, a cover panel of substantially the outer same size as said base panel for holding the blowers on the uppermost of said intermediate panels against movement in a direction perpendicular to said panels, and bands extending around said panels in contact with the bottom surface of the lowermost of said panels for interconnecting securely said panels to form a solid package of blowers.

2. A package of blowers of the character described comprising, a plurality of blowers each having a volute shaped housing with an outlet duct extending outwardly from said housing and terminating in a rectangular opening, a base panel, a plurality of substantially rigid flat intermediate panels, each of said panels having secured on the top side thereof a plurality of aligned and correlated guide block sets, each said set having one base block and an anchor block for each size blower wheel adapted to be packaged in the combination, said anchor blocks being spaced from said base block distances equal to the distance between opposite corners of said rectangular openings of said blowers adapted to be packaged in the combination, each said blower having its outlet duct extending downwardly against said top surface of one of said panels with the opposite corners of said openings being engaged by said base and anchor blocks of one of said sets for positioning and holding said blowers in spaced relation to each other and to the edges of said panels and against transverse movement with respect to the plane of said top side, said panels being positioned vertically above one another so that the lower sides of said intermediate panels engage said volute shaped housings opposite said outlet ducts on said blowers on the panel immediately therebelow to hold said blowers against movement in a direction perpendicular to said panels, a cover panel of substantially the outer same size as said intermediate and base panels for holding the blowers on the uppermost of said intermediate panels against movement in a direction perpendicular to said panels, and means extending around said panels for securely interconnecting said panels to form a solid package of blowers.

3. A blower shipping pallet combination comprising, a plurality of blowers each having a volute shaped housing with an outlet duct extending outwardly from said housing and terminating in a rectangular opening, a plurality of substantially rigid flat panels each having secured on the top side thereof a plurality of aligned upstanding guide blocks spaced apart a distance equal to the distance between opposite corners of said rectangular openings, each said blower having its outlet duct extending downwardly against said top surface of one of said panels with the opposite corners of said openings being engaged by said guide blocks for positioning and holding said blowers in spaced relation to each other and to the edges of said panels and against transverse movement with respect to the plane of said top side, said panels being positioned vertically above one another so that the lower sides of said panels engages said volute shaped housings opposite said outlet ducts on said blowers on the panel immediately therebelow to hold said blowers against

movement in a direction perpendicular to said panels, a cover panel of substantially the outer same size as said flat panels for holding the blowers on the uppermost of said flat panels against movement in a direction perpendicular to said panels, said blowers being disposed in vertically aligned stacks, spaced support rails on the lower side of said base panel for holding said base panel above the level of the ground, each of the edges of each of said panels and said rails having a notch therein aligned with each of said stacks, and bands extending around said

panels so that said bands cross on the lowermost of said panels and said cover panel directly below and above each of said vertical stacks for interconnecting securely said panels and blower to form a rigid package of blowers.

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