Feb. 27, 1962 J. H. DEW 3,022,896

SHIPPING RACK

Filed May 22, 1959 3 Sheets-Sheet 1

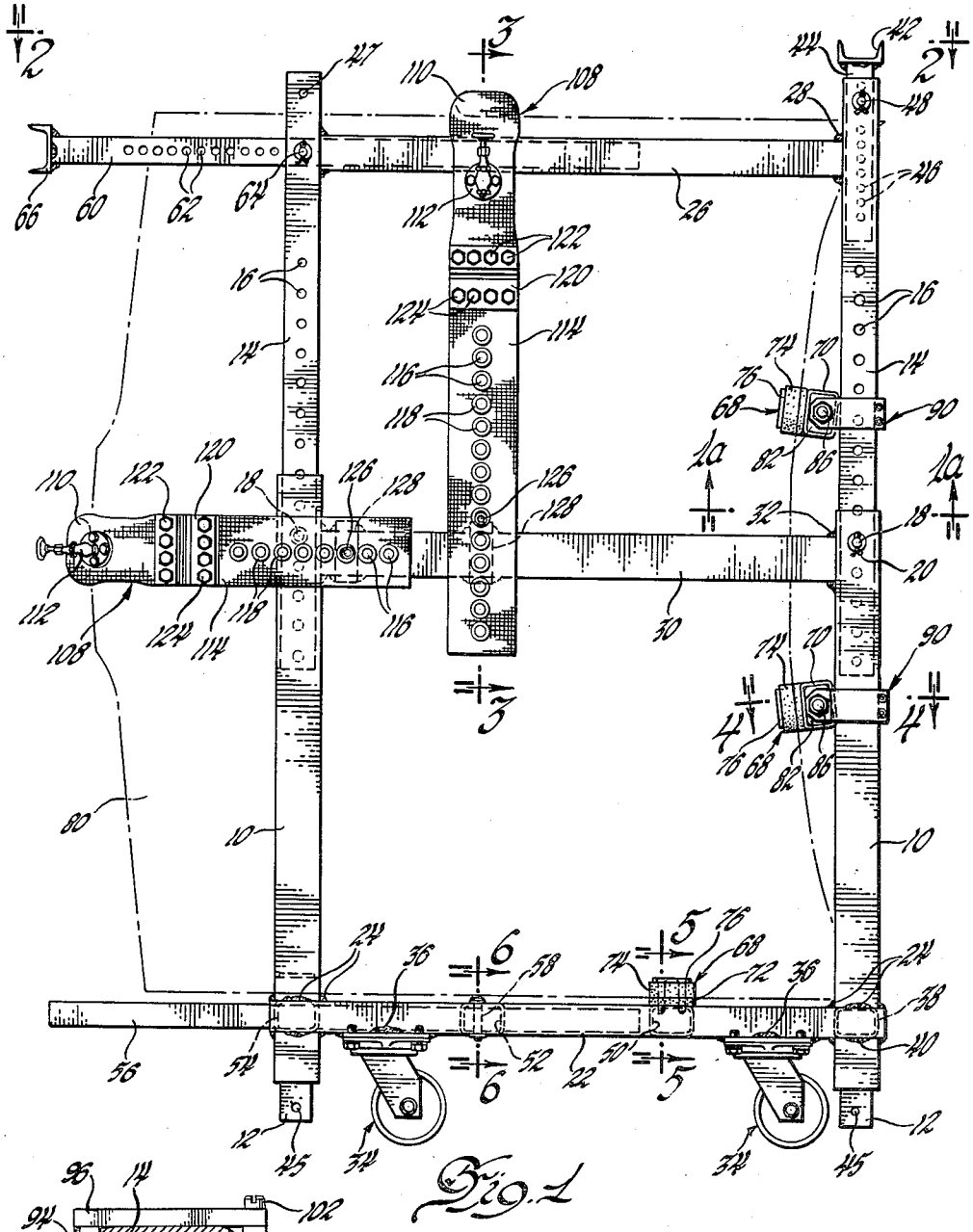


Fig. 1

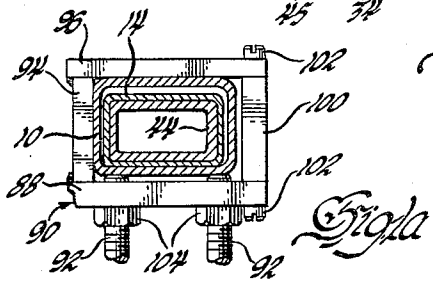


Fig. 7

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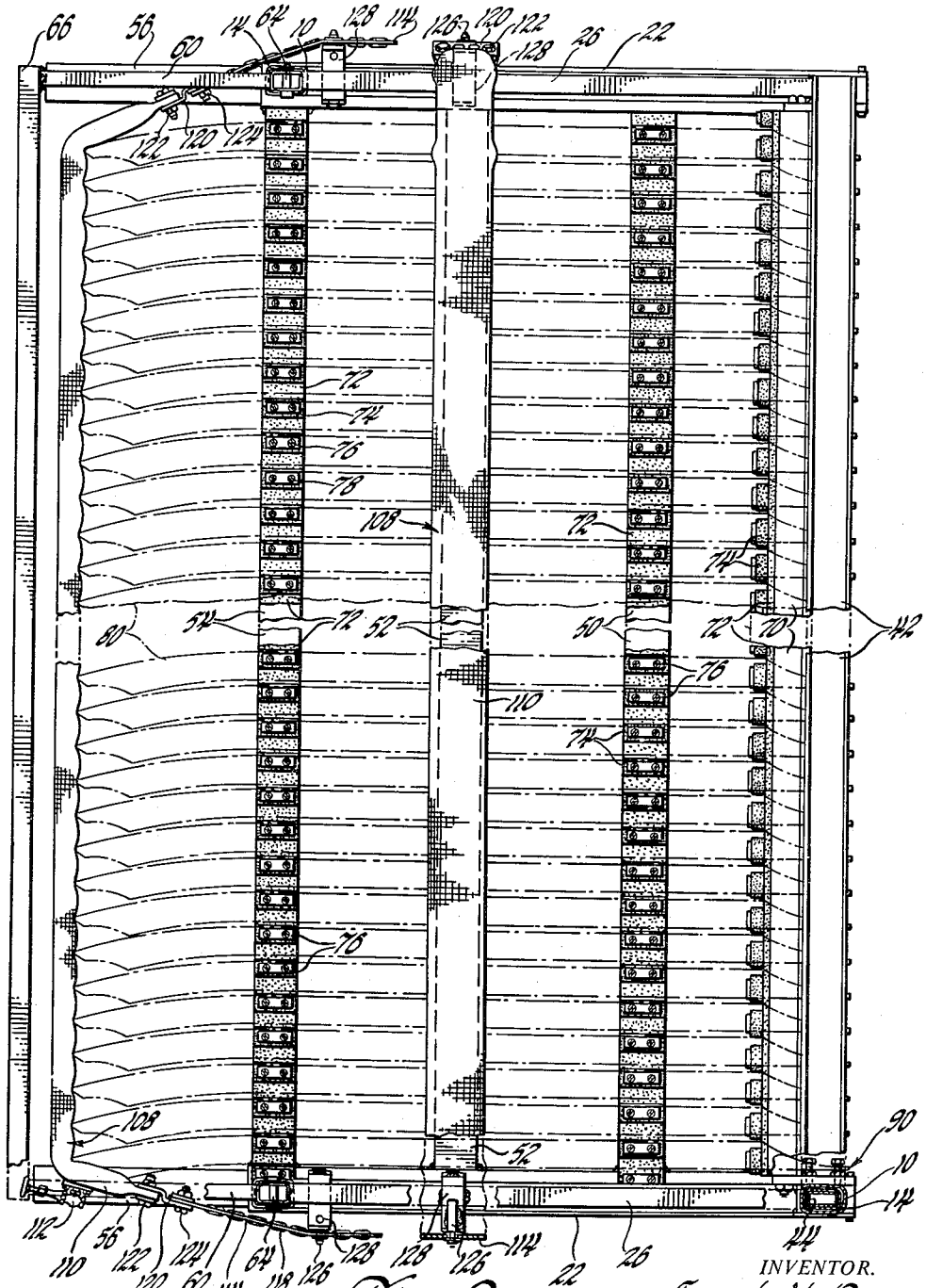


Fig. 2

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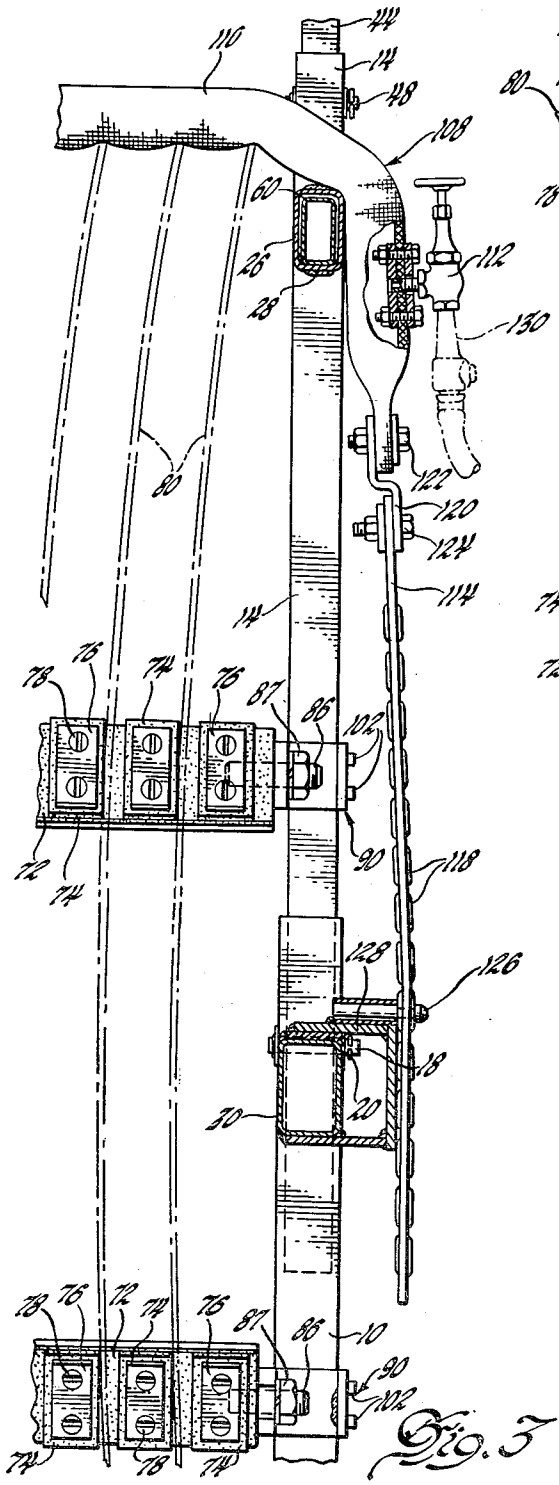


Fig. 3

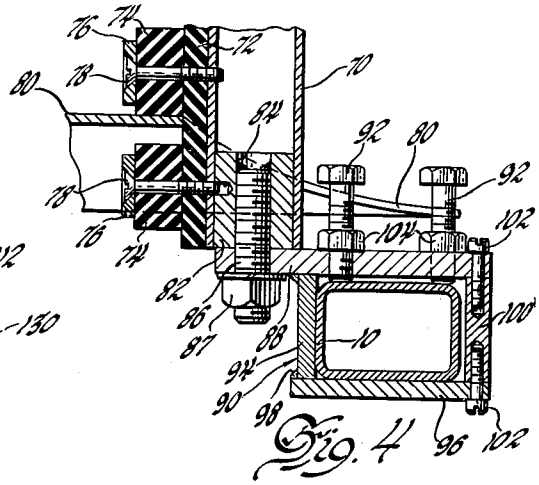


Fig. 4

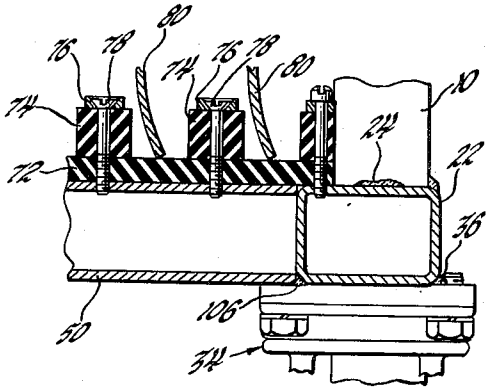


Fig. 5

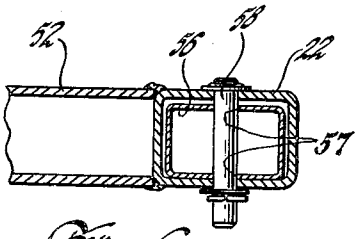


Fig. 6

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3,022,896

SHIPPING RACK

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11 Claims. (Cl. 211—13)

This invention relates to material shipping racks and more particularly to a shipping rack adapted to retain a series of large, oddly shaped pieces, and firmly secure and protect the pieces during shipment thereof.

Material shipping racks are widely used in many manufacturing and production industries for shipping parts from one spot to another, as by truck or by rail. Generally, a special shipping rack is required for each type of piece that may be shipped, because of the wide variety of shapes and sizes of parts used. In industries such as the automobile manufacturing industry, where large panels are required to be shipped from point to point, it is desirable to provide a shipping rack that is adaptable to many different panel shapes. With reference to vehicle hood panels, for example, it is easily seen that with design changes every few model years, a shipping rack must be adaptable to the varying shapes in the transportation of hood panels. Considering that hood panels are only one of a large number of parts of this nature, it is obvious that a suitable shipping rack must be quite versatile to be of any universal use.

At present, the usual method of shipping large panels is to stack the panels in a shipping rack of some configuration, in a manner such that the panels are able to bump against each other, damaging the finish and in some cases damaging the panels themselves. The resultant repairing and replacement costs for damaged panels has been a serious problem in the industry.

The device in which this invention is embodied is a material shipping rack adaptable to a wide variety of shapes and sizes. It is generally an open box-like structure with flexible and inflatable belts provided to secure the shipped parts within the shipping rack. A plurality of belts may be used, passing over and around the shipped parts, to retain the parts securely in place and to prevent engagement of the parts and resultant damage thereto. The shipped parts may be spaced within the shipping rack, to be absolutely sure that there will be no contact therebetween, and the resilient covering of the inflatable belts fills in the low areas between the parts to assure equal contact with all of the parts placed on the rack. As previously stated, the belts may be placed over and around the parts to be shipped, loosely engaging the parts on installation, and when inflated, will fit snugly around the parts to prevent shifting or movement during shipment. Releasing the air is sufficient to permit easy removal of the inflatable belts and the shipped parts.

Thus, a device is provided which eliminates a major problem in parts shipment, saving the shipper time and money in avoiding the replacement and repair of damaged parts.

These and other advantages will become more apparent from the following specification and drawings in which:

FIGURE 1 is an end view of the material shipping rack with the inflatable belts shown positioned around a series of vehicle hood panels.

FIGURE 1*a* is a cross-sectional view of the telescoping post-sections, taken along line 1*a*—1*a* of FIG. 1 looking in the direction of the arrows.

FIGURE 2 is a plan view of the material shipping rack of FIGURE 1.

FIGURE 3 is a view of a portion of the shipping rack illustrated in FIGURE 1, with parts broken away and in

section to show various features of the inflatable belt and connections therefor.

FIGURE 4 is a cross-sectional view of a portion of the shipping rack of FIGURE 1, taken along the line 4—4 of FIGURE 1 and looking in the direction of the arrows.

FIGURE 5 is a cross-sectional view of a portion of the shipping rack of FIGURE 1 taken along the line 5—5 of FIGURE 1 and looking in the direction of the arrows.

FIGURE 6 is a cross-sectional view of a portion of the shipping rack shown in FIGURE 1, taken along the line 6—6 of FIGURE 1 and looking in the direction of the arrows.

Referring more particularly to the drawings, the over all material shipping rack is best illustrated in FIGURE 1. One end of the rack will be hereinafter described and it should be understood that the opposite end will be of the same configuration. A plurality of vertical post sections 10, formed of box-like tubular sections, form the four corners of the material shipping rack. Received in the upper ends of each of the post sections 10 are upper post sections 14, of box-like or channel construction, which are telescopingly received within the lower post sections 10. A plurality of apertures 16, spaced along the upper post sections 14, and a pin 18, receivable through the lower post sections 10 and through any one of the apertures 16, provide a means for adjustably telescoping the upper post sections 14 within the lower post sections 10. A cotter pin, or the like, 20 may be provided to secure the pin 18 in the proper position and to prevent unauthorized removal thereof.

The front and rear lower post sections 10 are mounted on a bottom lateral rail 22, and secured thereto in any suitable manner, as by welding 24. A top lateral rail 26 is also secured to the upper post sections 14, as by welding at 28, to space the upper post sections the proper distance apart and to provide rigidity for the structure. A central lateral rail 30 is secured at each end to the lower post sections 10, as by welding at 32, to provide the proper spacing between the upper ends of the lower post sections 10 and to provide the proper rigidity for the structure.

Casters or rollers, illustrated generally by the numeral 34 and of any suitable type, may be secured to the bottom lateral rail in any suitable manner, as by welding 36, to permit easy movement of the shipping rack along a floor surface. The rollers or casters 34 are so positioned so as not to interfere with the feet 12 when the racks are stacked.

A plurality of longitudinal framing members extend between the two rear vertical posts, as illustrated in FIGURES 1 and 2. A bottom longitudinal rail 38 is welded, or otherwise secured, to the lower vertical post section, as at 40. An upper longitudinal member 42, formed of a channel member, or the like, is secured to a pair of vertical sections 44, telescopingly receivable in the upper post sections 14. A plurality of spaced apertures 46, formed through the telescoping section 44, and a pin 48, extending through the upper post section 14, provides for vertical adjustment of the top longitudinal rail 42. The top longitudinal rail and the telescoping section 44 may be removed from the structure and feet, similar to the feet 12 as shown, of a second shipping rack may be received in the open ends of the upper post sections 14 to stack the racks to a convenient height. The feet 12 are provided with an aperture 45, registering with the aperture 47 in the upper post section 14, to receive a pin for locking the parts when the racks are stacked. The top longitudinal rail 42 provides the necessary longitudinal spacing of the vertical posts and supplies longitudinal rigidity to the structure, as well as protecting the upper portion of the rack and parts.

A plurality of longitudinal members extend between the

opposing bottom lateral rails 22, and form the floor for the shipping rack. As illustrated in FIGURES 1 and 2, a pair of longitudinal rails 50 and 52 are shown extending between the two bottom lateral rails 22. A third longitudinal rail 54 extends between the front vertical lower post sections 10. All of the lower longitudinal rails are secured in any suitable manner to the bottom lateral rails 22, or to the vertical posts 10, as by welding.

In order to adjust the depth of the shipping rack, a pair of telescoping members 56 are received in the forward ends of bottom rails 22 and below the front lower vertical post sections 10. A plurality of spaced apertures 57, through the telescoping members 56, and a pin 58, received through the bottom lateral rail 22, provide the necessary adjustment of the telescoping members 56.

A similar construction is provided at the upper portion of the shipping rack, with the telescoping members 60 extending into the upper lateral rail 26 and through the front upper post sections 14. A plurality of spaced apertures 62 and a pin 64 through the upper post sections 14, provide the necessary adjustment. Secured to the upper telescoping members 60 and extending therebetween is a front longitudinal rail 66, secured to the telescoping members 60, to provide the necessary longitudinal spacing and rigidity.

In order to provide the proper spacing of the parts to be shipped, a plurality of spacer block assemblies, illustrated generally by the numeral 68, extend longitudinally of the shipping rack. A longitudinal box-like tubular rail 70 forms the base for each spacer assembly. The rails 70 are pivotally secured to the vertical posts 10. Referring now to FIGURES 4 and 5, the longitudinal rails 70 have a resilient strip 72 disposed along the exposed length thereof, and a plurality of resilient spacer blocks 74 spaced along the length of the strip 72 and the rail 70. Retainer members 76 and bolts 78 secure the spacer blocks and the strip to the rail 70. The parts to be shipped, such as hood panels 80, are received between adjacent spacer blocks 74, abutting the strip 72, and are protected thereby. A block 82, secured in any suitable manner to the end of the rail 70, has an internal bore 84 formed to receive a threaded stud 86. A nut 87 secures the threaded stud in a plate 88, the plate in turn being secured to the vertical post section 10 by the bracket assembly, illustrated generally by the numeral 90, and the bracket clamp bolts 92. The spacer block assembly is pivotable about the end studs 86 such that the openings between the adjacent blocks 74, and the exposed portions of the strip 72 will conform to the contour of the shipped part at that particular point to provide the optimum support and spacing therefor.

The bracket assembly, illustrated generally by the numeral 90, is comprised of a plurality of plates 88, 94, and 96, welded together as at 98 and of slightly larger cross-sectional area than the vertical post section 10. A closure plate 100 permits the bracket assembly to be slipped around the vertical post member 10, the closure plate member being secured to the plate members 88 and 98 by set screws 102 after the assembly is mounted. The bracket assembly may be thus securely clamped to the vertical post member 10 of the rack by the clamping bolts 92 and locked in position by the nuts 104.

In FIGURE 5, the lower spacer block assemblies are illustrated, in which the bottom longitudinal rail, such as rail 50, forms the supporting base for the rubber strip 72 and the spacer blocks 74. Retaining plates 76 and bolts 78 secure the spacer blocks and the strip to the lateral rail 50. The lateral rail is in turn welded, as at 106, to the bottom lateral rail 22.

In order to secure the spaced parts in the shipping rack, a plurality of inflatable belts, illustrated generally by the numeral 108, extend from one side of the shipping rack to the other, across the top and/or around the side of the spaced parts 80. The inflatable belt 110 may be of a resilient material backed with canvas, or the like, or of any suitable resilient material capable of being inflated with air at sufficient pressure to secure the parts in the shipping rack. An air valve 112, of any suitable type, is secured near the end of the inflatable belt for filling and exhausting the belt.

An adjusting web 114 is provided with a plurality of spaced apertures 116, with grommets 118 about each aperture, in order to adapt the belt to various sized parts. A generally S-shaped plate member 120 is secured to the inflatable belt 110 by a plurality of nut and bolt assemblies 122, and is similarly secured to the belt adjusting web 114 by the nut and bolt assemblies 124. The S-shaped plate 120 assures a pull of the belt 110 by the web 114 in the proper lineal direction.

A pin 126, secured to a bracket 128 welded or otherwise attached to the central lateral rail 30 at either side of the shipping rack, receives and secures the adjusting web 114. Any one of the spaced apertures 116 of the adjusting web 114 is receivable about the adjusting pin 126.

The operation and use of the above-described material shipping rack is as follows:

When the rack is empty, and it is desired to ship a plurality of parts such as the hood panels 80, the inflatable belts are removed from the shipping rack and the hood panels loaded therein. The panels are spaced apart by the spacer block assemblies and resiliently supported by the resilient strips 72. When the shipping rack is filled with hood panels, the inflatable belts are passed over and around the loaded shipping rack, such that the inflatable belt portions overlie the hood panels. The apertures 116 of the adjusting web 114, closest to the adjusting pins 126 are placed over the pins 126 so that the inflatable belt assembly is at least hand tight. The air valves are opened to admit air to the inflatable belt, a nozzle 130 from a suitable air supply filling the inflatable belts 110 to fit snugly around the hood panels and secure the panels in the shipping rack. The inflatable belt assures equal pressure on each of the hood panels stacked in the rack and assures that no one panel will be loose or unsecured.

In order to remove the hood panels at the completion of the shipment process, the air valves are opened to exhaust the air from the inflatable belts 110 and the adjusting webs easily disconnect from the pins 126. The parts may then be removed from the shipping rack.

In order to vary the adaptability of the shipping rack to parts other than vehicle hoods, such as vehicle door panels or vehicle fender panels, it is necessary only to vary the vertical height, through the telescoping post members, and to vary the spacer block assemblies, to provide the proper spacing for the panels to be shipped.

Thus, a shipping rack is provided with a wide range of adaptability, and a shipping rack that provides a positive securing of the shipped parts to prevent shifting or movement of the parts during the transport from one place to another.

What is claimed:

1. A material shipping rack comprising a plurality of vertical post members, each including two telescopically connected sections, a plurality of lateral telescopically connected framing members and a plurality of longitudinal framing members secured to said post members, said post members and said framing members defining a generally rectangular open structure, rack support means extending downwardly below said longitudinal framing members, a plurality of longitudinal floor rails extending between and connected to said lateral framing members, a plurality of spacer blocks secured to said floor rails and to some of said longitudinal framing members to space and protect the parts received in said shipping rack, a plurality of inflatable belt members adjustably secured to some of said lateral framing members and extending longitudinally of said shipping rack to engage the parts received in said shipping rack, and means for inflating said belt members to secure the parts received in said shipping

rack for movement of said shipping rack and the parts thereon without movement of the parts relative to each other and to said shipping rack.

2. A material shipping rack comprising a plurality of first post sections, lateral and longitudinal framing members secured to said first post sections and defining an open box-like structure with said first post sections, longitudinal rails extending between and connected to the lowermost of said lateral members and forming a floor, rack support means connected to said longitudinal rail and extending beneath said floor, second post sections telescopingly connected to said first post sections for varying the height of said shipping rack, lateral and longitudinal framing members secured to said second post sections for maintaining said second post sections in spaced relation, spacer means secured to said shipping rack to space and protect parts received in said shipping rack, a plurality of inflatable belt members adjustably received on some of said lateral members and extending longitudinally of said shipping rack, said belt members being receivable over the top and across the front of parts received in said shipping rack, and means for inflating said belt members when parts are loaded in said rack to secure the parts in position in said rack during shipment thereof.

3. A material shipping rack comprising a generally open box-like structure formed from first and second post sections and lateral and longitudinal framing members secured thereto, said second post sections having means for adjustable connection to said first post sections and being adjustable relative thereto to vary the height of said shipping rack, floor means secured to some of said lateral framing members to support the parts loaded in said shipping rack, spacer means secured to said shipping rack to space and protect parts received in said shipping rack, an inflatable belt member adjustably secured to others of said lateral framing members and extending longitudinally of said shipping rack, said belt member being disposable externally of the parts loaded on said shipping rack, and means for inflating said belt member to engage the parts loaded on said shipping rack and prevent movement of said parts during shipment thereof in said rack.

4. A material shipping rack comprising a generally open box-like structure formed from first and second post sections and lateral and longitudinal framing members secured thereto, said second post sections having means for adjustable connection with respect to said first post sections and being adjustable relative thereto to vary the height of said shipping rack, floor means secured to some of said lateral framing members to support parts loaded in said shipping rack, a plurality of spacer blocks secured to some of said longitudinal members to maintain the parts loaded in said rack in parallel spaced relation, an inflatable belt member secured to portions of said shipping rack, said belt member being disposable externally of the parts loaded on said shipping rack, and means for inflating said belt member to engage the parts loaded on said shipping rack and thereby prevent movement of said parts during shipment thereof in said rack.

5. A material shipping rack comprising a generally open box-like structure formed from first and second post sections and lateral and longitudinal framing members secured thereto, said second post sections having means for adjustable connection with respect to said first post sections and being adjustable relative thereto to vary the height of said shipping rack, floor means secured to some of said lateral framing members to support parts loaded in said shipping rack, a plurality of spacer blocks secured to some of said longitudinal members to maintain the parts loaded in said rack in parallel spaced relation, said spacer blocks being pivotally secured to said shipping rack to conform to the contour of the parts loaded in said rack, inflatable belt means secured to portions of said shipping rack and being disposable externally of the parts loaded on said shipping rack, and means for inflating said inflatable belt means to engage the parts loaded on said shipping rack and prevent movement of said parts during shipment thereof in said rack.

6. In a shipping rack for receiving and supporting sheet metal panels or the like in parallel spaced relation, and comprising a frame, a plurality of panel support rails secured to and extending along said frame, said rails having an inwardly facing resilient portion extending substantially the length thereof, a plurality of resilient spacer members secured to said rails and extending inwardly therefrom to define individual panel pockets formed along each of said panel support rails, adjustable means to variably position said panel support rails to accommodate differently dimensioned panels, said panel support rails being rotatably supported to provide for panel contour adjustment and to position said panel support rails in substantially parallel engagement with said sheet metal panels, resilient belt means attached to said rack and being engageable with said sheet metal panels for securement thereof in said panel pockets on said panel support rails, and adjustable belt-tightening means to variably position said resilient belt to accommodate differently dimensioned panels.

7. In a shipping rack for receiving and supporting sheet metal panels or the like in parallel spaced relation, and comprising a support frame having an L-shaped cross-section formed by longitudinally-extending bottom and side portions, rack support means fixed to said bottom portion of said support frame, a plurality of panel support rails secured to and extending along said frame on the top surface of said bottom portion and the adjacent surface of said side portion, said rails having an inwardly facing resilient portion extending substantially the length thereof, a plurality of resilient spacer members secured to said rails and extending inwardly therefrom to define individual panel pockets formed along each of said panel support rails, and resilient belt means attached to said rack and being engageable with said sheet metal panels for securement thereof in said panel pockets on said resilient parallel supports.

8. In a shipping rack for receiving and supporting sheet metal panels or the like in parallel spaced relation and comprising a support frame having an L-shaped cross-section formed by longitudinally extending bottom and side portions, rack support means fixed to said bottom portion of said frame, a plurality of panel support rails secured to and extending along said frame on the top surface of said bottom portion and the adjacent surface of said side portion, said rails having an inwardly facing resilient portion extending substantially the length thereof, a plurality of resilient spacer members secured to said rails and extending inwardly therefrom to define individual panel pockets formed along each of said panel support rails, adjustable means to variably position said panel support rails to accommodate differently dimensioned panels, and resilient belt means attached to said rack and being engageable with said sheet metal panels for securement thereof in said panel pockets on said resilient panel supports.

9. In a shipping rack for receiving and supporting sheet metal panels or the like in parallel spaced relation and comprising a support frame having an L-shaped cross-section formed by longitudinally extending bottom and side portions, a plurality of panel support rails secured to and extending along said frame, said rails having an inwardly facing resilient portion extending substantially the length thereof, a plurality of spacer members secured to said rails and extending inwardly therefrom to define individual panel pockets formed along each of said panel support rails, adjustable means to variably position said panel support rails to accommodate differently dimensioned panels, resilient belt means attached to said rack and being engageable with said sheet metal panels for securement thereof in said panel pockets

on said panel support rails, and adjustable belt-tightening means to variably position said resilient belt means to accommodate differently dimensioned panels.

10. In a shipping rack for receiving and supporting sheet metal panels or the like in parallel spaced relation and comprising a support frame having an L-shaped cross-section formed by longitudinally extending bottom and side portions, a plurality of panel support rails secured to and extending along said frame on the top surface of said bottom portion and the adjacent surface of said side portion, said rails having an inwardly facing resilient portion extending substantially the length thereof, a plurality of spacer members secured to said rails and extending inwardly therefrom to define individual panel pockets formed along each of said panel support rails, adjustable means to variably position said panel support rails to accommodate differently dimensioned panels, said panel support rails being rotatably supported to provide for panel contour adjustment and to position said panel support rails in substantially parallel engagement with said sheet metal panel, resilient belt means attached to said rack and being engageable with said sheet metal panels for securement thereof in said panel pockets on said panel support rails, and adjustable belt-tightening means to variably position said resilient belt to accommodate differently dimensioned panels.

11. In a shipping rack for receiving and supporting sheet metal panels or the like in parallel spaced relation and comprising a support frame having an L-shaped cross-section formed by connected bottom and side portions, a plurality of panel support rails secured to and extending along said frame on the top surface of said bottom portion and the adjacent surface of said side portion, said rails having an inwardly facing resilient portion extending substantially the length thereof, a plurality of spacer members secured to said rails extending inwardly therefrom to define individual panel pockets formed along each of said panel support rails, inflatable belt means attached to said rack and being engageable with said sheet metal panels for securement thereof in said panel pockets on said panel support rails, and means for inflating said inflatable belt means to engage the sheet metal panels loaded on said shipping rack and prevent movement of said panels during shipment thereof in said rack.

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