Aug. 24, 1943. O. C. FERGUSON 2,327,410

SHIPPING DEVICE FOR LIGHT AIRPLANE PARTS

Filed Sept. 13, 1941 2 Sheets-Sheet 1

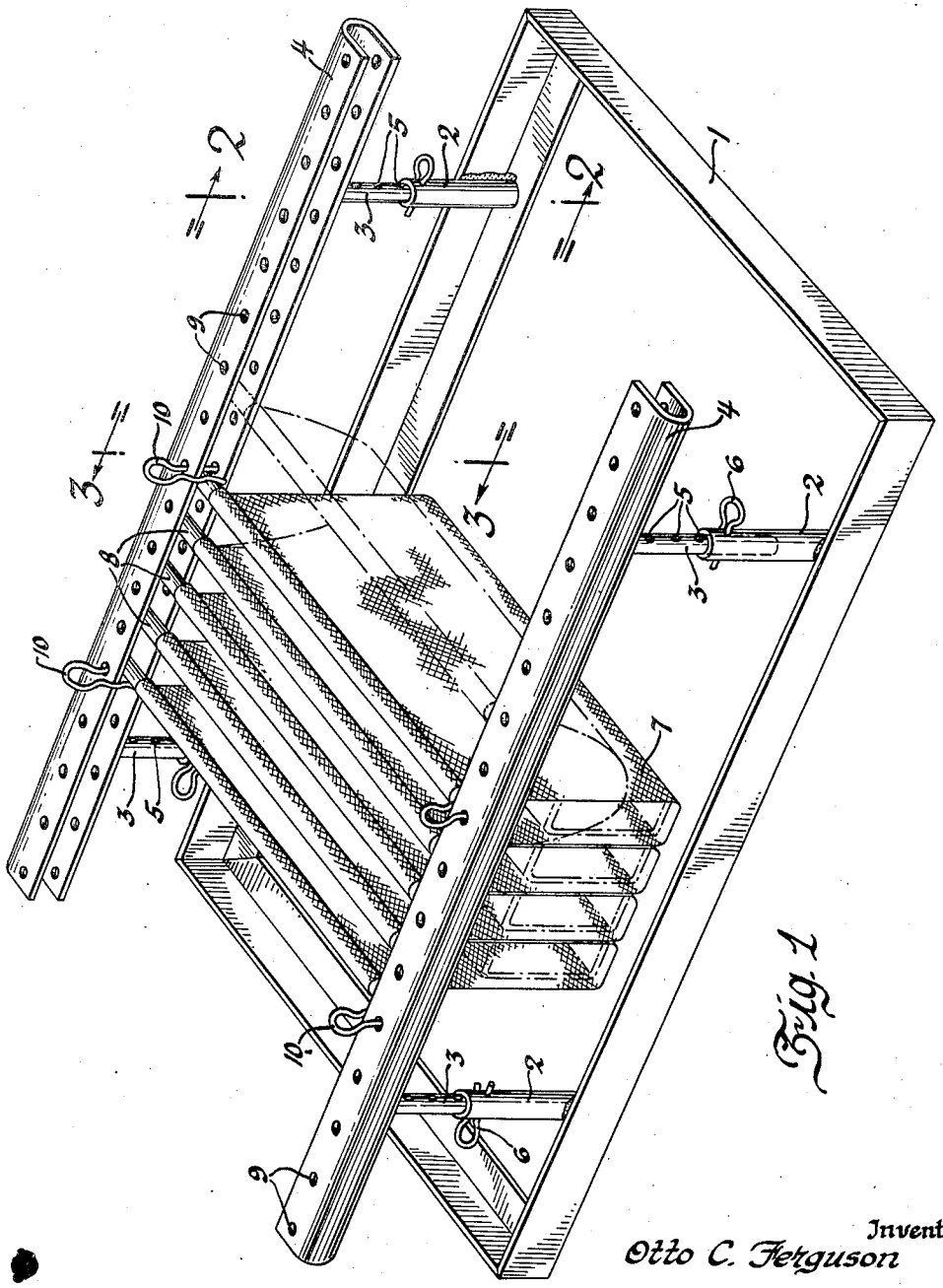


Fig. 1

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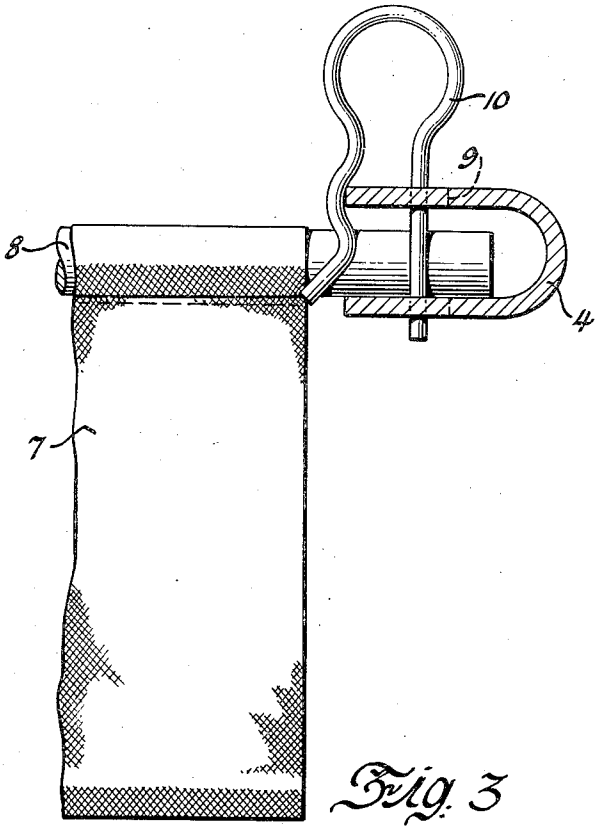


Fig. 3

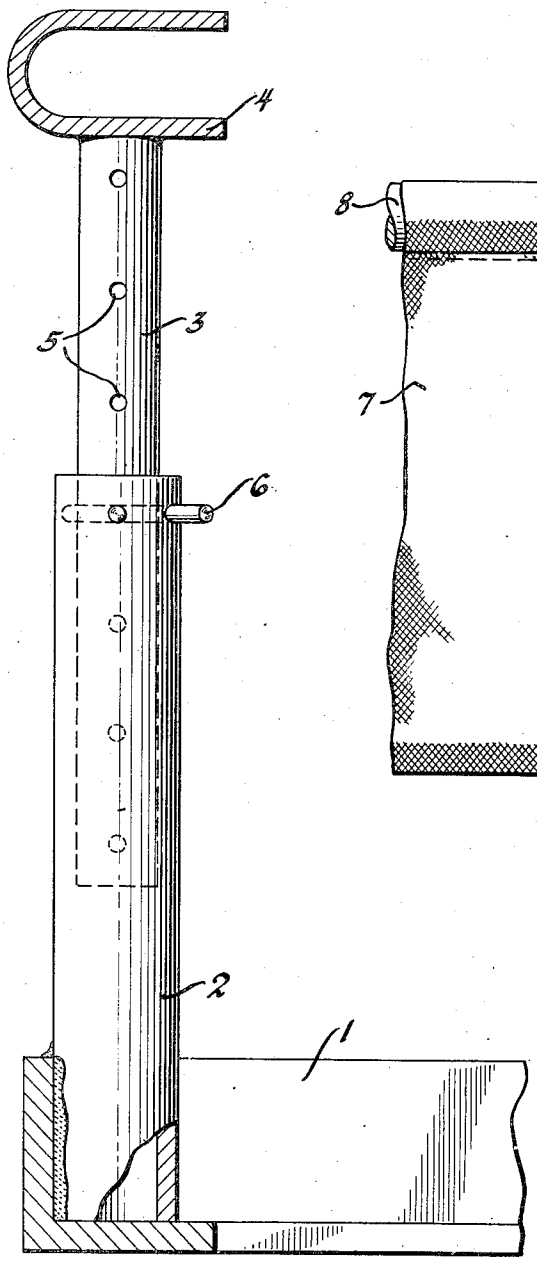


Fig. 2

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Patented Aug. 24, 1943 2,327,410

UNITED STATES PATENT OFFICE

2,327,410

SHIPPING DEVICE FOR LIGHT AIRPLANE PARTS

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Application September 13, 1941, Serial No. 410,730

5 Claims. (Cl. 211—13)

This invention relates to shipping and storage containers adapted especially for industrial use and for handling formed and semiformed parts and small sub-assemblies. Under the present plan for increasing airplane production, various parts are being made at different plants and shipped to a final assembly plant. Scarcity of materials and equipment, the element of time, and the necessary high degree of perfection required, all combine to demand more than ever the exercise of extreme care in handling the parts in a manner to protect them from injury from the start of manufacture to eventual use.

It is an object of the invention to provide an improved loading container particularly useful in the handling of small, light-weight, precision parts which need to be kept free from surface scratches, dents and the like and which container may be loaded with a large number of parts at the point of manufacture and then managed as a unit during storage and transportation.

A further object of the invention is to provide individual article retainer pockets of flexible material suspended more or less loosely within the container so that each article is enveloped between soft surfaces and cradled in a hammock which hangs from the top and swings to cushion shock.

Among other objects of the invention are the provision of a load encompassing unit which is adjustable in height to accommodate sets of pockets of different depths and the provision of sets of pockets each comprising a group of transverse suspension rods having opposite ends slidably mounted in the sides of the container and a strip of flexible material draped over and secured at spaced intervals to the rods with the portions between the rods depending downwardly to afford a succession of article receiving loops. After the loops are loaded through the top, the rods are crowded together to close the mouths of the several pockets and to bring the pockets into close fitting side by side abutment and then additional sets of pockets are similarly filled until the container is fully loaded. The fully loaded container may be transferred by the usual industrial truck to storage position or into a freight car with other container units and shipped for unloading at the point of final assembly.

Additional objects and advantages will become apparent during the course of the following specification, having reference to the accompanying drawings wherein: Figure 1 is a perspective view of the container and Figures 2 and 3 are detail sectional views taken respectively on lines 2—2 and 3—3 of Figure 1.

A suitable base for the container unit may consist of a rectangular frame 1 formed of angular iron straps welded at the corners and on each side of which are welded a pair of upstanding hollow posts 2 to telescopically receive complementary posts 3. Transversely spaced side rails 4, preferably of channel form as shown and opening inwardly toward one another, are supported by the two pairs of vertical posts and are adjustable vertically with reference to the base 1 by the telescopic fit of the post sections 2 and 3, one of which has a series of spaced transverse openings as at 5 to register selectively with an opening through the other post section to receive a locating pin 6.

Between the side rails 4 and of substantially the width of the container are located a number of article suspension devices each including, for convenience, a multiple pocket unit afforded by a strip or sheet 7 of flexible material such as canvass, felt, carpeting or the like folded back and forth upon itself with opposite ends of the sheet and the upper crests of the undulations draped over and secured as by stitching a fold around spaced transverse rods 8 whose opposite ends project beyond the edges of the sheet and are received within the grooved trackways afforded by the channeled side rails. The flexible strip 7 being secured to the bars 8 at spaced intervals afford depending open ended pockets or loops between adjacent bars to embrace and hug tightly the articles to be shipped. Such articles by their size will determine the proper spacing between the suspension bars 8 and therefore the width as well as the depth of the pockets. Positioning of the side rails 4 as to height will be in accordance with the depth of the pockets.

For loading and unloading the pockets the bars 8 are spread apart somewhat as illustrated by the broken lines in Figure 1 but normally they are gathered together so that the mouth at the top of each suspended flexible loop is restricted in size and each of the several pockets hanging loosely therefrom will be in abutment with its neighbor. This side by side abutment, as well as the tension in the loops under gravity or weight of the articles embraced, insures frictional engagement to hold the articles in place between the flexible facings of the suspended loop. While only one group of pockets is illustrated in the drawings, additional suspension units can be placed in the guide tracks until the container is substantially full. Suitable means may be em-

ployed to retain the units against displacement, a satisfactory arrangement being the provision of a group of spaced holes 9 in the rails 4 to receive selectively the locating pins 10 for engagement with the transverse bars 8. These pins 10 preferably are interchangeable with and similar to the locating pins 6 and as best seen in Figure 3, each comprises a hairpin of spring wire having one straight leg constituting the locating pin and a wavy leg affording a spring latch for retaining the locating pin in place.

I claim:

1. In a shipping device of the character described, a base, vertically adjustable posts carried by the base at each side thereof, a pair of channeled rails supported by said posts in transversely spaced parallelism and with their channels opening inwardly toward one another, a series of article carrying cellular containers supported by the rails in the space above the base and each comprising a flexible sheet folded back and forth upon itself a number of times to provide article containing cells between the upwardly open folds and a group of transversely extending sheet suspending bars having their opposite ends slidably fitted within the channeled rails with the endmost bars secured to opposite ends of the sheet and the intermediate bars secured to the upper crests of the sheet folds to suspend the article containing cells therefrom in abutment with one another and means to retain the suspension bars on the rails in selected load carrying position.

2. In a material handling device of the character described, a load container having a pair of spaced inwardly open retainer grooves, a series of suspension bars separable from the container and arranged to bridge said space with opposite ends slidably fitted to said grooves, a strip of flexible material draped over the bars with intervening folds hanging loosely therefrom and constituting individual pockets to receive articles to be shipped, said bars being slidable apart in the grooves to spread the folds and slidable together in the grooves to contract the folds and bar engaging retainer means for confining the folds in crowded together article storage relation.

3. A load container including parallel horizontally spaced rails of channel section opening toward one another, a series of load suspension bars having their opposite ends removably insertable and slidably tracked within said channeled rails and being arranged in groups, flexible sheets, one for each group of bars, and each flexible sheet being draped over the bars of its associated group and being secured thereto with the portions of the sheet between succeeding bars hanging down to provide open top article receiving pockets, each sheet and its associated group of bars constituting a unit separable individually from the rails and applicable to the rails in succession with other like units, said bars being shiftable on the rails to distend the pocket top openings and means to secure the bars of successively applied units in crowded together relation on said rails after said pockets are loaded.

4. In a shipping device, a load cradling unit comprising a series of transverse suspension bars and load embracing loops of flexible material hung from said bars for contraction and expansion of their mouths upon adjustment of the bars toward and from each other and an encompassing unit to enclose said cradling unit interchangeably with other similar units differing in relative loop depth, said encompassing unit comprising a base, a pair of transversely spaced rails above the base to provide supporting tracks for the loop suspension bars of the cradling units, and means supporting the rails on the base for relative vertical adjustment to selective height settings determined by loop depth of the cradling unit.

5. In a shipping device, a load encompassing unit having a top loading opening and comprising a base and a pair of inextensible slideways supported on posts above the base defining therebetween said top loading opening, a load cradling member separable from said unit and comprising a flexible sheet of accordion pleated formation and a series of suspension bars hanging the folds of said sheet for side by side frictional contact and having projecting opposite ends resting slidably on the slideways for shifting of the bars selectively, said bars being independently spreadable in relation to one another to open the folds individually for the loading thereof through said top opening and contractible to compact the folds for gripping the load and means to confine the endmost of said bars to hold the cradling member against spreading and the folds thereof successively in tight abutment.

OTTO C. FERGUSON.