

PATENT SPECIFICATION

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(54) BUTT HINGE WITH MEANS TO PREVENT THE WEAR OF KNUCKLES

(71) We, YOSHIDA KOGYO K.K., a corporation duly organized under the laws of Japan and existing at No. 1, Kanda Izumicho, Chiyoda-ku, Tokyo, Japan, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates generally to butt hinges, and more specifically to improved means to prevent the wear of the abutting or opposed ends of pintle-receiving knuckles on the leaves of a butt hinge.

The leaves of a butt hinge in general use have interfitting, axially aligned knuckles along their opposed marginal edges for receiving a pintle or pin therethrough, so that the leaves are swingable one with respect to the other on the pintle. In this type of hinge the abutting ends of the knuckles are highly susceptible to wear and noise production due to frictional forces exerted thereon in the use of the hinge.

There have been known some antifriction means designed to eliminate the above noted defect of butt hinges. Japanese Utility Model Publication No. 48-4607 discloses a typical example of such means, which comprises a pair of plastic rings mounted between the opposed ends of each two adjacent knuckles. Each ring has an integral pin projecting into an internal recess in the knuckle with which the ring is in contact. This prior art means, however, is not truly simple in configuration or easy and economical of manufacture as compared with the means of the instant invention.

The present invention seeks to provide highly simplified, inexpensive and easily manufacturable means adapted to be readily installed in position to prevent the wear of, and noise production by, the opposed ends of knuckles on the leaves of a butt hinge.

According to the invention, there is provided, a butt hinge of the type comprising a pair of leaves having interfitting, axially aligned knuckles along their adjacent marginal edges, and a pintle passing through said knuckles for swingably uniting said

leaves, wherein a pair of rings of wear resisting material is interposed between the opposed ends of each two adjacent knuckles so as to receive said pintle therethrough, each of said rings having a respective pair of fingers adapted to straddle the marginal edge of that one of said leaves which is engaged by the ring.

Since the rings with their fingers are of absolutely planar configuration, they are easily and inexpensively mass-producible by punching operation on sheet metal, plastic or like wear-resisting material. Another advantage of the invention resides in the ease of assemblage of a complete hinge, for the planar rings are readily installable between the aligned knuckles of the two leaves. Although the rings may first be installed in displacement in the axial direction of the knuckles, they can be readily slid into position along the opposed edges of the leaves.

The invention will now be further described with reference to the accompanying drawing, in which:—

Figure 1 is an exploded perspective view of a butt hinge incorporating the improved means of this invention;

Figure 2 is a front elevational view showing the hinge of Figure 1 in completely assembled form; and

Figure 3 is a top plan view of the hinge of Figures 1 and 2.

With reference first and in particular to Figure 1 the illustrated butt hinge has a pair of rectangular leaves 10 and 11 having screw holes 12 of suitable construction and relative placement. The left hand leaf 10 is shown to have a pair of axially aligned, spaced knuckles 13 along its marginal edge opposed to the corresponding edge of the right hand leaf 11. These knuckles 13 are adapted to receive therebetween a knuckle 14 on the opposed edges of the right hand leaf 11. The knuckles 13 and 14 on both leaves are thus interfittable in axial alignment. The leaves 10 and 11 with their knuckles 13 and 14 may each be an integral aluminum extrusion.

The axially aligned knuckles 13 and 14 are intended to accommodate the shank

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portion of a pintle 15 having a head 16. A retainer ring 17 as usual retains the pintle 15 within the knuckles 13 and 14 against detachment in the use of the hinge.

5 The invention is specifically directed to pairs of rings 18 to be interposed between the opposed ends of the adjacent knuckles 13 and 14. These rings 18 are made of wear resisting material such as stainless steel or
10 other hard metals or plastics. Each ring corresponds in shape and size to the cross section of the knuckle 13 or 14 and has a pair of parallel spaced fingers 19 that are arranged in slight displacement from the
15 diametrical direction of the ring. The pair of fingers 19 has a sufficient spacing to receive the knuckle-carrying marginal edge of the leaf 10 or 11 and is in coplanar relationship to the ring 18.

20 For the assemblage of the above identified hinge parts into the form shown in Figures 2 and 3, the pair of rings 18 should be interposed between the opposed ends of each two adjacent ones of the interfitted knuckles
25 13 and 14. The pairs of fingers 19 of the respective rings 18 should then straddle or embrace the opposed edges of the respective leaves 10 and 11. The pintle 15 may now be inserted into the aligned knuckles 13 and
30 14 and rings 18 and secured fast by the retainer ring 17.

35 Since the fingers 19 of each paired rings 18 grip the respective leaves 10 and 11, the rings rotate in sliding contact with each other with the swinging movement of the leaves. No frictional force is therefore to be exerted on the opposed ends of the knuckles 13 and 14.

40 The improved means of this invention has been described hereinbefore as adapted for

the particular hinge shown. However, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction shown and described. The invention, instead, should be construed to be inclusive of all suitable modifications and equivalents falling within the scope of the following claims.

WHAT WE CLAIM IS:—

1. A butt hinge of the type comprising a pair of leaves having interfitting, axially aligned knuckles along their adjacent marginal edges, and a pintle passing through said knuckles for swingably uniting said leaves, wherein a pair of rings of wear resisting material is interposed between the opposed ends of each two adjacent knuckles so as to receive said pintle therethrough, each of said rings having a respective pair of fingers adapted to straddle the marginal edge of that one of said leaves which is engaged by the ring.

2. A butt hinge as claimed in claim 1, wherein said pair of fingers of each said ring are in coplanar relationship thereto.

3. A butt hinge substantially as hereinbefore described with reference to and as illustrated in the accompanying drawings.

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