

Oct. 24, 1939.

F. PESARESE

2,177,441

OIL AND DUST PACKING FOR ROTATING AXLES OR SHAFTS

Filed April 7, 1938

2 Sheets-Sheet 1

Fig. 1

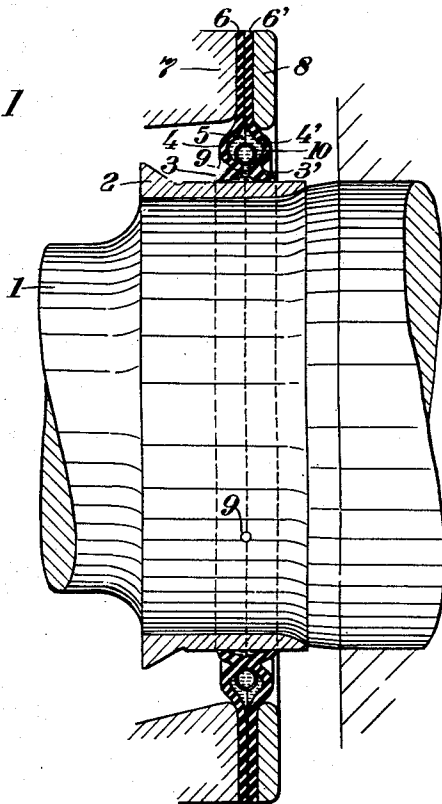


Fig. 2

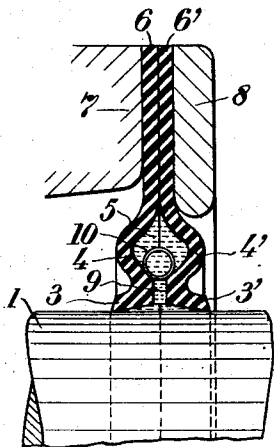


Fig. 4

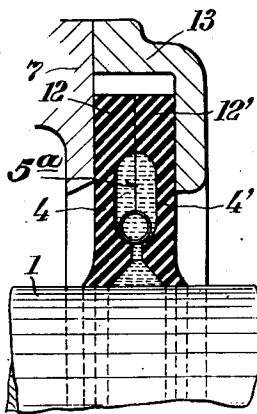
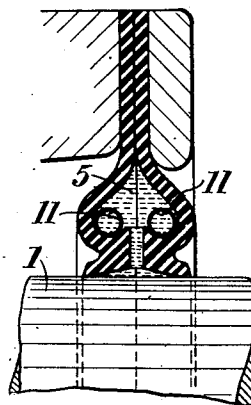


Fig. 3



Inventor

Fritz Pesarese,

by D. T. Wreghitt
Attorney

Oct. 24, 1939.

F. PESARESE

2,177,441

OIL AND DUST PACKING FOR ROTATING AXLES OR SHAFTS

Filed April 7, 1938

2 Sheets-Sheet 2

Fig. 5.

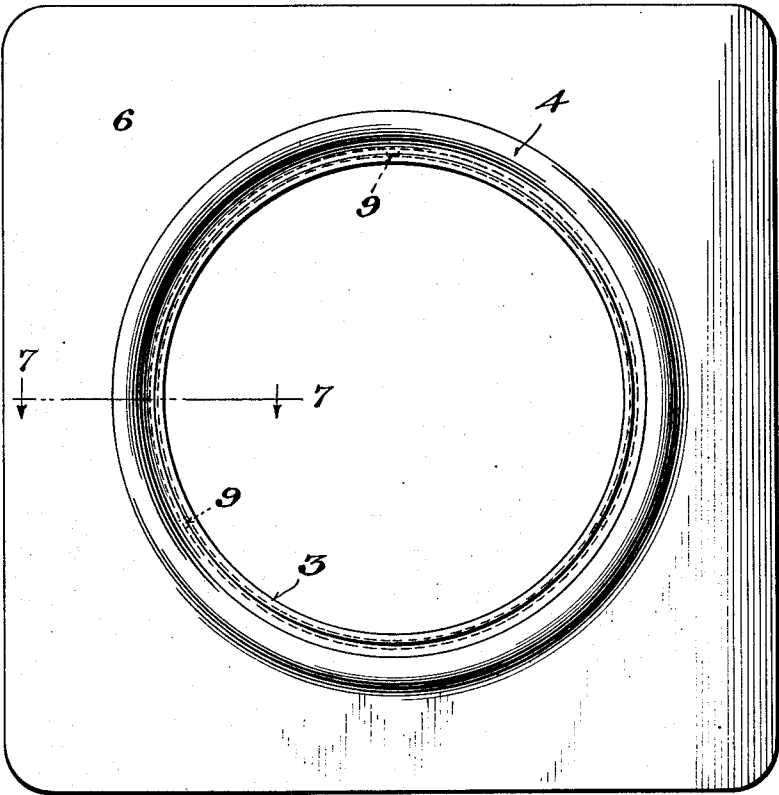


Fig. 6.

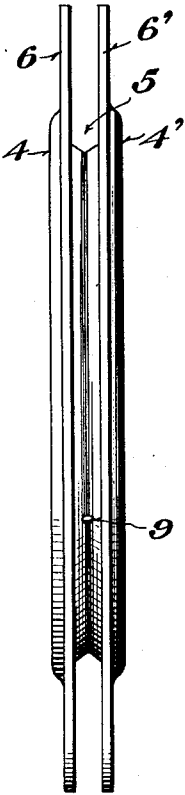
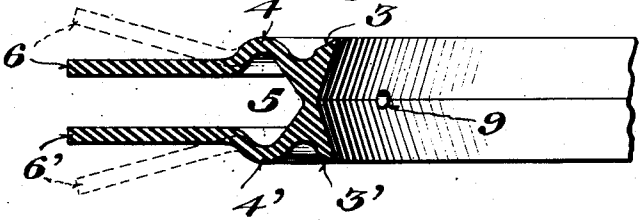


Fig. 7.



Inventor

Fritz Pesarese,

By

D. P. Wilhelm
Attorney

UNITED STATES PATENT OFFICE

2,177,441

OIL AND DUST PACKING FOR ROTATING
AXLES OR SHAFTS

Fritz Pesarese, Berlin-Wilmersdorf, Germany, as-
signor to Achslager, Syndikat, Berlin-Wilmers-
dorf, Germany, a syndicate of Germany

Application April 7, 1938, Serial No. 200,705
In Germany September 13, 1937

9 Claims. (Cl. 286—6)

This invention relates to oil and dust guards for rotating axles or shafts, and comprises a unit of non-porous elastic material provided with an annular hollow lubricant retaining space encircling the axle or shaft, and held in place by the walls or parts of the housing in which the axle or shaft is mounted to insure against both the ingress of dust and the leakage of lubricant.

While it has been heretofore proposed to make oil and dust guards of flexible materials, such as leather, specially treated fabric, or the like in the form of rings, sections, or collars carried by or mounted on metallic or other supports, such materials are not inherently elastic and moreover are porous, or on the other hand, are not oil resistant, and, therefore, after a relatively short period of use they become unserviceable because they either lose their inherent qualities or are deprived of their packing effectiveness, by wear due to the movement of the parts. Generally for these reasons it has been necessary to make such packings or guards of non-elastic, rigid material. And, in order to apply them to the axle or shaft, and at the same time to attain the required sealing pressure about the shaft or axle, it has been necessary to make the guard in two parts or sections, which, in spite of careful workmanship, does not preclude the possibility of the seepage or discharge of oil where the sections meet or where the sections engage the axle. Moreover, such devices are costly to manufacture. A further disadvantage of rigid oil or dust guards resides in the fact that they cannot compensate or adequately adjust themselves to the movement which occurs between the axle or shaft and the bearing housing unless they are mounted for relatively free movement with respect to the housing walls. However, the provision for such movement renders necessary the use of special packings, gaskets, sealing strips or the like and this again gives rise to additional loose joints with consequent loss of oil.

Accordingly, the present invention has primarily in view the provision of a unitary guard made of synthetic rubber, rubber substitutes, or rubber compounds or similar material which may be readily molded and which have inherent elasticity, flexibility, and oil resistant properties while at the same time being non-porous. Because of its elasticity, a guard constructed in accordance with the present invention may be stretched over the axle or shaft and snugly embrace the same, while at the same time the outer portions thereof may be properly clamped or held to or in the housing. Thus, all movement

between the axle or shaft and its housing which occurs in the direction of the axle, or radially of the axle, may be readily equalized in the material itself and particularly in the flexible annular lubricant chamber or cavity formed therein and intended to surround the axle so that the displacement of the guard on the shaft is reduced to a minimum, and the hitherto required additional packings or seals against the walls of the housing are dispensed with. Since, as previously indicated the edges of the guard are resilient, like the body, they may be clamped in the walls of the housing in such a way as to make the loss of oil along the walls of the housing impossible.

Accordingly, it will be apparent that the present invention obviates all of the disadvantages or draw-backs of the types of packings heretofore described and has the important advantage, that because of its oil tightness under all conditions of use, permits of raising the oil level in the bearing box beyond the opening of the housing intended for the entrance of the axle.

Constructional forms of the invention are shown by way of example, in the accompanying drawings in which:

Figure 1 is a full cross-section through the guard or packing according to the invention.

Figure 2 is an enlarged partial view according to Figure 1.

Figure 3 is a view of a modified form having two pressure springs in the oil chamber.

Figure 4 is a view of another constructional form.

Figure 5 is a plan view of the molded unit.

Figure 6 is a side elevation.

Figure 7 is a detail view showing how the flexible side walls may be opened up to permit the filling of the lubricant chamber with oil or grease.

Similar reference characters designate corresponding parts throughout the several figures of the drawings.

A distinctive feature of the present invention is the provision of an elastic or resilient unit which may be molded into the desired shape and form and which possesses the necessary resilience and elasticity to not only permit of the same being stretched over the axle to insure a persistently tight fit thereon, but which also permits of mounting the edges of the body of the unit in resiliently clamped relation to the portions of the journal box or housing in which it is mounted.

A unit according to the present invention may be used for packing all types of shafts in which the packing or holding of the lubricant is re-

quired, for example, for journal bearings, of every kind which offer requirements of tightness between moving parts, although it has special utility in its application to axle bearings for railway vehicles.

Referring to Figures 1 and 2 of the drawings it will be observed that the present unit is provided with the axle or shaft engaging flanges 3 and 3' extending in opposite directions and providing therebetween an arched portion when the flanges engage the shaft 1 as shown in Figure 2 or an oil ring 2 as shown in Figure 1. The body of the unit adjoining the flanges is provided with the outwardly bowed or arcuate walls 4 and 4' which define a hollow space or chamber 5 for receiving lubricant. The arcuate walls 4 are a part of the side walls 6 and 6' which may be of any width or depth according to the type of installation, but in any case are preferably co-extensive as will be apparent from Figures 5 and 6. The said walls 6 and 6' may according to the forms of the invention shown in Figures 1, 2 and 3, be clamped firmly between the housing 7 and an annular plate or ring 8. In other words, the walls 6 and 6' may be firmly clamped between two portions of the box or housing in such a way that both are pressed together when in use thereby to effectively close the lubricant chamber 5. As will be apparent from the drawings, the said chamber 5 may be provided with openings or holes 9 for permitting the lubricant stored in the chamber to pass into the space defined by the oppositely projecting flanges 3 and 3'.

While, as previously indicated, the unit has in itself inherent elasticity, nevertheless, if desired, a suitable pressure spring or springs may be used within the chamber to augment the inherent tendency of the unit to grip the axle. The springs 10 and 11 are preferably of the continuous spiral type formed into a ring. In installations where a spring or springs are desired, it will, of course, be understood that the same are placed in the chamber while the walls 6 and 6' are spread apart as shown in Figures 6 and 7 and before they are closed by being clamped between parts of the box or housing as shown in Figures 1, 2 and 3.

In connection with Figure 3 it may be pointed out that the general construction involved is the same as that shown in Figures 1 and 2 except that the walls which form the lubricant chamber 5 are sufficiently enlarged to provide for the accommodation of two springs 11 instead of one as in Figures 1 and 2.

While it is preferred to tightly grip the walls 6 and 6' between the parts of the box or housing, as previously indicated, nevertheless, it is within the scope of the invention to so clamp them that their outer edges may be covered and at the same time a space may be provided between the said outer edges and the ring or cover therefor to provide for greater displacements of the guard than might be permitted by the walls which form the oil chamber, at the same time, however, maintaining an effective yielding oil seal. Accordingly, as shown in Figure 4 the lubricant chamber 5a may be formed by the walls 4 and 4' which are straight instead of curved and which have their ends 12 and 12' clamped between the housing part 7 and a covering ring or cap 13. In this form the guard is adapted to compensate or equalize slight displacements between the axle and the housing as in the forms shown in Figures 1-3, due to the inherent resiliency or elasticity of the body itself, while

in the case of greater displacements, the ends 12 and 12' may slide against the walls 7 and the cap 13 to a certain extent. However, it will be understood that the walls 12 and 12' form an elastic seal with the parts 7 and 13.

Figures 5, 6 and 7 show the improved molded guard or packing before it is installed for use and it is believed to be apparent that owing to the flexibility of the side walls which form the lubricant receiving chamber, they may be readily spread apart as indicated in Figure 7 to receive either the springs 10 or 11 or to permit of packing lubricant or grease in the chamber before the unit is stretched over the axle. It will, of course, be understood that the normal interior diameter of the central opening defined by the outer edges of the flanges 3 and 3' is less than the diameter of the axle or shaft so that at all times the flanges 3 and 3' yieldingly grip the axle or shaft.

From the foregoing it will be apparent that a guard or packing according to the present invention comprises a resilient body having a central opening defined by a pair of oppositely directed flanges formed integrally with side walls designed to provide an oil or lubricant receiving chamber which may supply lubricant to the underside of the flanges and to the axle through suitable openings. The flanges 3 and 3' bear tightly against the axle or shaft and each forms an acute angle with the radial central plane of the body of the packing so that the flanges form an effective oil retaining and dust protecting seal about the axle or shaft.

In addition to providing an effective seal and lubricant supplying means between itself and the axle or shaft, the present device makes it possible to raise the oil level in the box or housing as previously indicated. As this device assures the absolute tightness of the box or housing, it will be quite possible to fill the box or housing with lubricant up to a point or level higher than the lowest periphery of the opening of the housing for the entrance of the axle.

The fact that the flanges 3 and 3' are supplied with lubricant from the chamber 5 reduces the friction between the flanges and shaft or axle so that wear is reduced to a minimum and long service is obtained. In other words, the invention provides a self-lubricating tight fitting guard which not only excludes dirt but retains lubricant, and, also, because of the inherent resiliency of the portion of the guard between the axle and the parts of the box or housing by which it is engaged, it is possible to take care of the movement of the axle in the direction of its radius as well as its longitudinal displacement without impairing the effectiveness of the seal.

I claim:

1. An oil or dust guard for rotating axles or shafts comprising a body made of molded elastic oil resistant material having a central opening whose normal diameter is less than the diameter of the axle or shaft to permit said body to be stretched over the axle to form a tight seal therewith, means forming an annular lubricant chamber in said body adjacent said central opening, and means for establishing communication between said chamber and the portion of said central opening which engages the shaft or axle.

2. An oil or dust guard comprising a molded body of elastic material provided with a central opening, said body at the opening being provided with oppositely extending flanges for en-

gaging the surface of the axle or shaft, the walls of said body at one side of said flanges being formed to provide a resilient lubricant chamber, and the said walls beyond said lubricant chamber being adapted to be pressed together in sealing relation to close one side of the lubricant chamber, and means in the body between said flanges for establishing communication between said lubricant chamber and the space between said flanges.

3. In a mounting for axles or shafts the combination with the housing therefor, of an oil and dust guard comprising a body of elastic material formed with a central opening defined by oppositely extending flanges and wall portions integral with said flanges, the part of the wall portions adjacent said flanges being formed to provide a lubricant chamber, and the portions of said walls remote from said flanges being clamped between portions of said housing.

4. In a mounting for axles or shafts the combination with the housing therefor, of an elastic and resilient dust guard adapted to inherently compensate for relative movement between the axle and the housing, said dust guard being formed of non-porous, flexible material and including a pair of oppositely extending flanges disposed at substantially an acute angle to a vertical plane intersecting the medial portion of the body, and also including an oil chamber formed by the resilient side walls of the body adjacent the flanges, the said side walls of the body being held between portions of the housing, and means for establishing communication between the oil chamber and the space between said flanges.

5. An oil and dust packing for rotating axles or shafts, comprising a member of elastic material for encircling said axle or shaft and having a tubular lubricant receiving chamber, flanges formed from said member at one side of said chamber and adapted to engage with said axle or shaft, said member being provided with openings for establishing communication between said lubricant chamber and the space between said flanges, and spring means within said cavity tending to urge said flanges toward the axle or shaft.

6. An oil and dust packing for rotating axles or shafts comprising a body including a pair of flanges which bear against the said axle or shaft, each flange forming an acute angle with the radial central plane of the packing, a pair of

walls provided on the body and adjoining said flanges to form a hollow space for receiving lubricant, openings for establishing communication between said space for receiving lubricant and the space covered by said flanges, and means in said hollow space for urging said flanges toward the axle or shaft.

7. An oil and dust packing for rotating axles or shafts comprising in combination with a portion of the bearing housing, an elastic unit having its outer edges clamped between portions of said housing and having a chamber for receiving lubricant, a pair of oppositely offset flange members extending from the portion forming the lubricant chamber and adapted to engage with the axle or shaft, and openings arranged between said flange members for establishing communication with the lubricant chamber, and means for urging said flange members toward the axle or shaft.

8. An oil and dust packing for rotating axles or shafts comprising in combination with a portion of the bearing housing, an elastic unit having a portion thereof clamped between portions of said housing and having a chamber for receiving lubricant, a pair of opposite flanges extending from the base of said lubricant chamber and adapted to engage with the axle or shaft, openings arranged between said flanges for establishing communication with the lubricant chamber, and a spiral pressure spring housed within said lubricant chamber and bearing against the bottom portion thereof thereby to yieldingly force the flanges into engagement with the axles or shaft.

9. An oil and dust guard for axles and shafts comprising a body made of molded elastic non-porous, material, said body having a central opening whose edge portion yieldingly embraces the axle or shaft, the portion of said body adjacent said opening having spaced walls formed to provide a lubricant receiving reservoir having lubricant outlets, said walls being adapted to normally stand free of each other, prior to installation to provide access to the lubricant chamber and for filling the same with lubricant, and said walls being adapted to press together when installed to close the outer side of the lubricant chamber and provide a fluid tight seal with the box or housing in which the axle is mounted.

FRITZ PESARESE.