

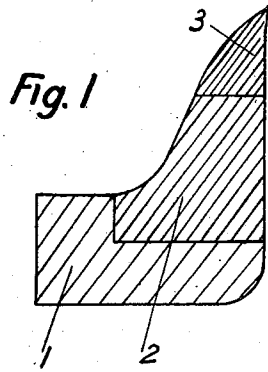
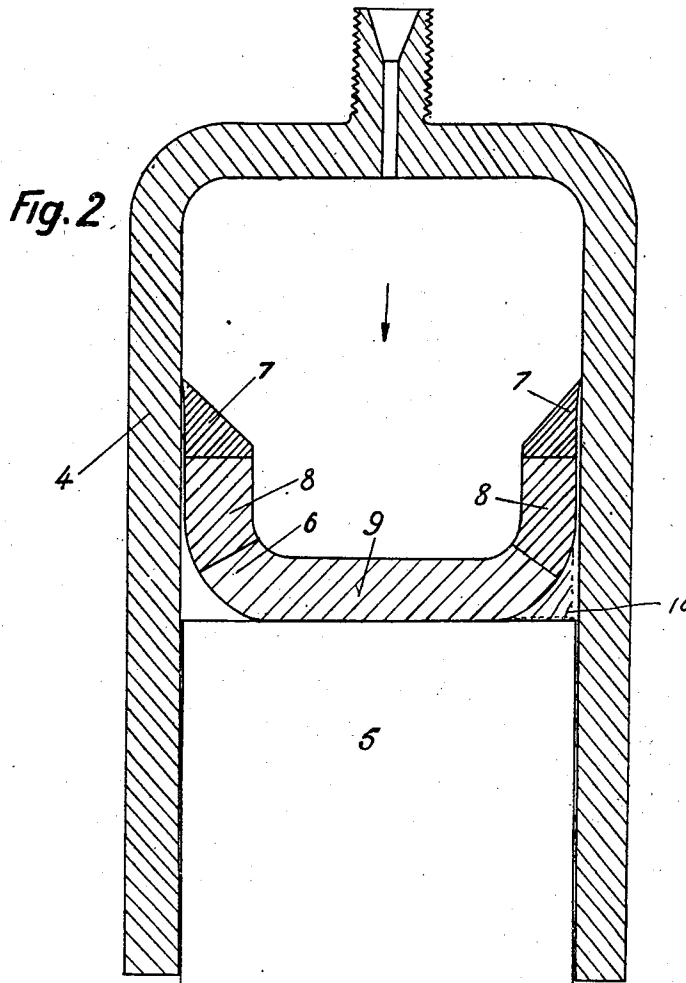
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J. G. L. DUVAL

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PLASTIC COMPOSITION AND PACKING DEVICE

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Inventor
Jean Georges Luis Duval
By *Ernest Elbert Stern & Cailley*

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PLASTIC COMPOSITION AND PACKING
DEVICE

Jean Georges Louis Duval, Saint-Cyr-sur-Mer,
France, assignor to Olaer Patent Company,
New York, N. Y., a society of New York

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It is known that packing devices made of a plastic matter such as are used for ensuring fluid tightness between two parts adapted to move with a reciprocating motion with respect to each other, and this whatever be the plastic matter of which these packing devices are made, have a serious drawback due to the fact that the matters in question are never wholly unalterable under their conditions of utilization.

As a matter of fact, these matters undergo variations and, in particular, they become dry and often finally stick against the wall with which the packing device is intended to come in contact. It follows that, when the machine has been stopped for a certain time and is again started, portions of these packing devices may be torn off, which is of course detrimental of a good fluid tightness between the parts in relative movement.

The object of the present invention is to provide a packing device of the type above described which is better adapted to meet the requirements of practice than those made up to the present time, and, in particular, which avoids the drawbacks above cited.

After numerous experiments, I succeeded in constituting a new matter, which is formed in combination by a plastic matter, either synthetic or natural and by a certain percentage of a waxy or fatty substance incorporated in the plastic matter and which does not dry and does not crystallize in the presence of air within the range of temperatures of utilization.

I have thus obtained compositions of matter constituted, in particular, by rubber, either natural or artificial, such as neoprene, butadiene, some polyvinyl polymerization products, etc., on the one hand, and oil, paraffin, ozocerite, etc., on the other hand. These compositions of matter have the property of constantly exuding, in small amounts, from their surface, the waxy or fatty substance incorporated in the plastic matter and this during a very long time.

These compositions of matter are therefore free from the drawbacks above mentioned concerning the packing devices with which the present invention is concerned.

Consequently, according to an important feature of the invention, a packing device of this kind is made, at least partly, of the composition of matter above described.

It will be readily understood that such a packing device never becomes dry and furthermore (which constitutes a particularly important advantage) that the friction between the packing device and the wall along which it is in contact is

considerably reduced, whereby the mechanical resistance of the machine and the wear and tear of the packing device itself are greatly diminished.

Another object of the present invention is to provide a packing member made of the composition of matter above referred to (that is to say consisting of a plastic matter in which a fatty or waxy substance is incorporated) the various parts of which have different mechanical properties.

This requirement is based upon the following facts:

a. Preferably, the portion which is to rub against the surface of the part along which fluid-tightness is to be ensured is to be made relatively hard;

b. On the contrary, the portion extending between that above referred to and the base of the packing device should be made relatively flexible; while;

c. The base proper should be as rigid as possible; and,

d. It is useless, if not disadvantageous, to make this base of a composition of matter having the property of exuding a fatty or waxy substance.

It is clear that the rigidity of the base of the packing facilitates its good fixation avoiding to flow between the piston and the support it would be advantageous to have the base at right angle to.

With this object in view, I have obtained, according to the present invention, packing devices made of a single piece and the various portions of which have different mechanical, physical and chemical characteristics. For instance, I have obtained, by vulcanization of the whole, a mass including a portion (intended to form the free edge of the packing device) of considerable hardness and however capable of exuding, for a very long time, the waxy or fatty matter which has been incorporated in this portion during the preparation of the packing device. For this purpose, according to a feature of my invention, this portion of the mass has received, in addition to said fatty or waxy matter, suitable vulcanization accelerators.

The intermediate portion of the packing device has, on the contrary, a character of plasticity owing to the matters which have been incorporated therein.

Finally, the base of the packing device is rigid and contains little or no fatty or waxy substance.

It will be readily understood that, in the course of the vulcanization process, various portions of the mass may be of different compositions, in such manner as to constitute, after vulcanization, a

single piece the various portions of which have different characteristics.

The invention is therefore concerned, in a particular manner, with the method consisting in forming packing devices having portions of different properties, and also with the new product constituted by a plastic packing device made of portions having different respective mechanical properties, and this even in the case of the plastic matter being free from waxy or fatty substances. Of course the invention also includes such a packing device in which a fatty or waxy substance has been incorporated so as to be able subsequently to exude therefrom.

It should be well understood that account should be taken, in the course of the manufacture of the combined matter which constitutes the packing device, of the properties of the various plastic matters that may be used, either natural or artificial, when in presence of the fatty or waxy substances to be incorporated therein. Thus, as it is known that natural rubber is attacked by hydrocarbons, the fatty or waxy matter to be used with natural rubber must preferably not be a mineral oil. Similar precautions will be taken for other bodies.

The amount of fatty or waxy substance present in the composition of matter which constitutes the packing device may vary according to the case. In some cases it may be very high. In some cases, I have incorporated in the plastic matter a proportion of liquid higher than 50 per cent. On the other hand, it should be also well understood that any other body or substance can be incorporated into the composition of matter during the manufacture thereof, in such manner, for instance, as to reinforce it.

Other features of the present invention will result from the following detailed description of some specific embodiments thereof.

Preferred embodiments of the present invention will be hereinafter described with reference to the accompanying drawing, given merely by way of example, and in which:

Fig. 1 is an axial sectional view of a packing device made according to the present invention;

Fig. 2 is a similar view of another embodiment of the invention.

In Fig. 1, I have designated by reference numeral 1 a portion of the packing device which constitutes the base thereof, by 2 the intermediate portion, and by 3 the free edge or lip portion of said packing device.

These three portions are made of different compositions and they are vulcanized simultaneously so as to have, after vulcanization, different mechanical resistances, respectively. Thus base 1 may be given a high rigidity; portion 2 has a certain flexibility; and edge 3 has a rigidity and a mechanical resistance which enable it to support without too important wear the friction stresses to which it is subjected.

In Fig. 2, I have shown at 4 a cylinder, at 5 a piston, and at 6 a packing member made of a plastic matter shaped to form a kind of membrane. The respective portions 1, 2 and 3 of this member are preferably made of different compositions so that, after vulcanization, they have different mechanical properties. Thus, in this example, portion 1 is preferably very rigid; portion 2 is very elastic so as to deform easily under the effect of the pressures acting thereon. As for portion 3, which constitutes the bottom of the packing device, it may be made either more rigid than portion 2, or also of a high elasticity.

It should be well understood that such a pack-

ing device may be made with the incorporation, either in the whole thereof or only in a portion, of a fatty or waxy matter, provided that at least two portions thereof have different properties.

In a general manner, while I have, in the above description, disclosed what I deem to be practical and efficient embodiments thereof, it should be well understood that I do not wish to be limited thereto as there might be changes made therein without departing from the principle of the present invention as comprehended within the scope of the appended claims.

What I claim is:

1. A vulcanized packing member comprising portions of different respective compositions and having different respective mechanical properties due to their different chemical composition and due to their combined vulcanization at least one portion comprising a plastic material and a substance of a lubricating nature incorporated therein, this material and said substance being so chosen that this portion has the property of continuously exuding this substance from its surface.

2. A vulcanized packing member comprising a plurality of portions of different respective compositions and having different respective mechanical properties, due to their different chemical composition and due to their combined vulcanization, at least one portion comprising a plastic material consisting chiefly of rubber and a fatty substance incorporated in said rubber, said fatty substance being so chosen that this portion of the packing member has the property of continuously exuding said fatty substance from its surface.

3. A vulcanized packing member including a plurality of portions of different respective compositions and having different respective properties, due to their different chemical composition and due to their combined vulcanization, said portions including a lip which is rigid and resistant, a base, and a flexible intermediate portion between said lip and said base, at least the first mentioned portion comprising a plastic material and a substance of a lubricating nature incorporated therein, this material and said substance being so chosen that this portion has the property of continuously exuding this substance from its surface.

4. A vulcanized packing member for use in connection with a piston sliding in a cylinder comprising a cylindrical top portion bevelled at the inner side so as to end upwardly in a circular edge, said top portion being adapted to engage slidably said cylinder, a flat base adapted to bear against said piston, and an intermediate portion for interconnecting these two first mentioned portions, these portions being of different respective composition and having different respective mechanical properties due to their different chemical composition and due to their combined vulcanization, the first and second mentioned portions being rigid and the third flexible, at least the first mentioned portion including a plastic material and a substance of a lubricating nature incorporated therein, this material and this substance being so chosen that this first mentioned portion has the property of continuously exuding this substance from its surface.

5. For use between a piston and a cylinder, a vulcanized packing member including a cylindrical edge adapted to fit in said cylinder, a flat base adapted to bear against said piston, and an intermediate portion for interconnecting these

two first mentioned portions, these portions being of different respective compositions and having different respective mechanical properties due to their different chemical composition and due to their combined vulcanization, the first portion being rigid and the second and third being flexible, at least the first mentioned portion including a plastic material and a substance of a lubricating nature incorporated therein, this material and this substance being so chosen that this portion has the property of continuously exuding this substance from its surface.

6. A vulcanized packing member comprising a top portion, a base portion and an intermediate portion for joining said top portion to said base portion, said portions being of different respective composition and having different respective mechanical properties due to their different chemical composition and due to their combined

vulcanization, the first and second mentioned portions being rigid and the third flexible.

7. A vulcanized packing member for use in connection with a piston sliding in a cylinder comprising a cylindrical top portion bevelled at the inner side so as to end upwardly in a circular edge, said top portion being adapted to engage slidably said cylinder, a flat base adapted to bear against said piston, and an intermediate portion for interconnecting these two first mentioned portions, these portions being of different respective composition and having different respective mechanical properties due to their different chemical composition and due to their combined vulcanization, the first and second mentioned portions being rigid and the third flexible.

JEAN GEORGES LOUIS DUVAL.