

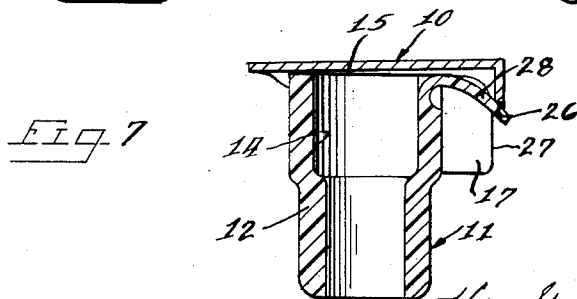
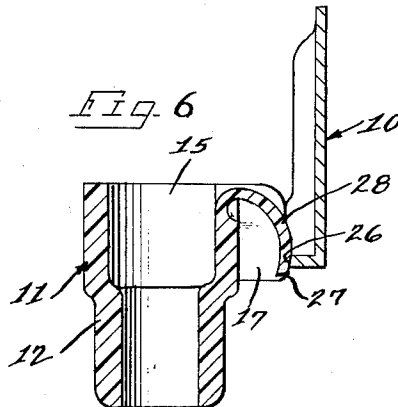
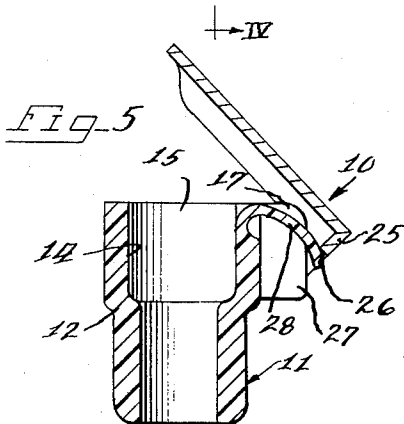
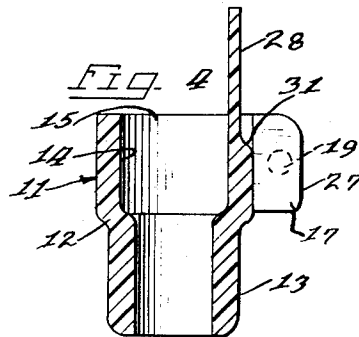
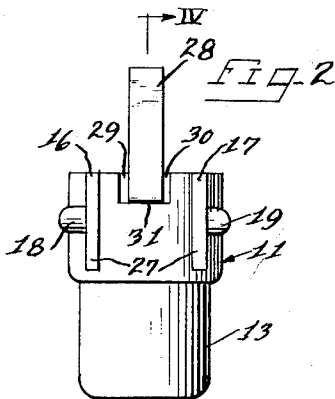
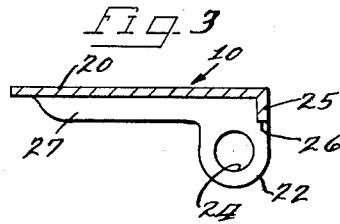
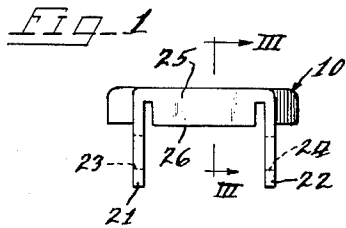
Feb. 11, 1964

D. J. WARNER

3,120,879

OIL CUP WITH INTEGRAL SPRING

Filed Sept. 15, 1961



INVENTOR.

Dale J. Warner

BY

Hill, Sherman, Morris, Lane & King, e.
ATTORNEYS

1

3,120,879

OIL CUP WITH INTEGRAL SPRING

Dale J. Warner, Chicago, Ill., assignor to Gits Bros. Mfg. Co., Chicago, Ill., a corporation of Illinois
Filed Sept. 15, 1961, Ser. No. 138,317
5 Claims. (Cl. 184-91)

The present invention relates to improvements in oiler mechanisms of the type having an oil cup with a hinged cover spring urged to closed position for covering the cup, and particularly to an improved cup and spring construction.

In oil cups of the above type, various arrangements have heretofore been employed for spring urging the cover toward closed position so that it will automatically snap shut when released. The oil cup cover is usually lifted manually or by the oil can spout for placing oil in the opening at the top of the cup, and when the cover is released it will snap shut. Coiled wire torsion springs have been employed but are relatively expensive to manufacture and assemble and encounter other disadvantages. Leaf springs have been employed and leaf spring arrangements supported on the cover have also been used but have not proven fully satisfactory in all respects. In the manufacture of oil cup assemblies in large numbers, savings in the number of steps required in manufacture and the complexity of assembly effect a savings in cost of a substantial nature and provide other advantages in simplification of manufacture and assembly.

It is accordingly an object of the present invention to provide an improved oil cup assembly wherein the manufacture is accomplished in a fewer number of steps and wherein the structure permits a saving in cost in manufacturing and assembly procedures.

Another object of the invention is to provide an oil cup assembly with an improved spring arrangement which is more reliable in the spring action that will result from the manufactured assembly and requires less close tolerances in manufacture and assembly.

A still further object of the invention is to provide an oil cup assembly which is very easy to assemble.

A feature of the present invention is the provision of an oil cup assembly wherein a cover is supported on a cup housing by trunnion pins projecting into bearing openings in the cover and mounted on resilient vertical flanges for moving the trunnion pins inwardly to snap into the openings in the cover.

Another feature of the invention is the provision of an oil cup having a housing manufactured of a plastic material with a spring tongue integral with the housing and bent to a prestressed position for engaging the cover and urging it to closed position.

Other objects, advantages and features will become more apparent with the teaching of the principles of the invention in connection with the disclosure of the preferred embodiment thereof in the specification, claims and drawings, in which:

FIGURE 1 is a rear elevational view of an oil cup cover before assembling on an oil cup;

FIGURE 2 is a rear elevational view of the oil cup;

FIGURE 3 is a vertical sectional view taken substantially along line III—III of FIGURE 1;

FIGURE 4 is a vertical sectional view taken substantially along line IV—IV of FIGURE 2;

FIGURE 5 is a vertical sectional view, similar to the sections of FIGURES 3 and 4, showing the cover assembled on the cup;

FIGURE 6 is a vertical sectional view of the assembled cup and cover, showing the cover in an open position; and

FIGURE 7 is a vertical sectional view similar to FIGURE 6, but showing the cover closed.

2

As shown on the drawings:

The drawings show an oil cup assembly including an oil cup cover 10 and an oil cup 11. The cup 11 has a cylindrically shaped body or housing 12 with a slightly reduced lower portion 13 for mounting the housing such as by a press fit into an opening in a machine part for directing oil to the moving parts or bearings of the machine. Within the housing 12 is a chamber extending through the housing and the chamber has an opening 15 at the top which is to be closed by the cover 10.

The cover is pivotally supported on the cup 11, and for this purpose vertically extending resilient ears or flanges 16 and 17 project from the wall of the housing 12 and are integral therewith. Laterally extending trunnion pins 18 and 19 are mounted at the outer side surfaces of the flanges 16 and 17.

The cover 10 has a flat planar upper portion 20 for covering the cup opening 15 in closed position, and a pair of ears 21 and 22 project downwardly at the rear of the cover 10. The ears have laterally extending holes 23 and 24 for receiving the trunnion pins 18 and 19. The trunnion pins thus provide bearings which are received by recesses in the form of the journal openings 23 and 24.

The rear edge of the cover 10 is turned downwardly at 25 with a downwardly facing edge or surface 26 which functions as a stop edge for limiting the opening movement of the cover as will be explained in connection with FIGURE 6, and which also serves as a reacting edge for engagement with a closing spring, as will be described.

The cover may also be turned downwardly at its sides in a shallow skirt portion 27 which is integral with the ears 21 and 22.

The cover 10 is urged toward closed position by an integral spring tongue 28 which in a normal unstressed position projects vertically upwardly, as shown in FIGURES 2 and 4, from the wall of the housing 12, and is integral therewith. The base of the spring tongue is shown at 31 below the upper edge of the cup, and notches 29 and 30 are at each side of the spring tongue separating it from the wall of the cup housing 12. In its construction as being integral with the cup wall, the spring tongue is curved outwardly at its base 31, at its outer surface, and is shown flush with the inner surface of the housing chamber 14.

While the spring tongue 28 may be secured to the housing wall by attachment, it is preferably integral, and the cup is preferably formed of a material which has the resilient characteristics necessary to provide spring resiliency for the tongue 28.

A preferred material is a resilient plastic and the cup and spring tongue are molded in a single manufacturing operation.

While the cup may be constructed of other plastics having the desired resilient characteristics, a preferred material is an acetal resin polymer of a thermoplastic polyoxyethylene, capable of being prestressed, and having a tensile strength of 10,000 p.s.i. at room temperature. The material has a flexural modulus of 410,000 p.s.i. and is only very slightly affected in strength by moisture. The polymer has a high strength retention at elevated temperatures and is therefore well suited to use in machinery where elevated temperatures are encountered. The material is also resistant to lubricants. At 200° F. the polymer has a tensile strength of 6,000 p.s.i., and a flexural modulus of 180,000 p.s.i. The thermoplastic is a high-melting, highly crystalline type of acetal resin polymer. A thermoplastic such as the type sold under the trade name Delrin is a suitable example of the type above disclosed.

A preferred construction for the spring tongue has the tongue extending in a vertical position parallel to the axis of the cup in a normal unstressed position. The

spring tongue is constructed of a thickness and width so that it will become prestressed when flexed outwardly and downwardly to a position at an angle of 45° with its vertical position. The spring reacting surface 26 is positioned relative to the spring tongue 28 so that the tongue operates beyond the 45° position, and preferably slightly beyond the 90° position as shown in FIGURE 7.

The spring reacting surface 26 also functions as a stop surface, engaging the vertical edges 27 of the flanges 16 and 17 when the cover is in the fully opened position as shown in FIGURE 6. A convenient stop position for the cover is when it is opened 90° as illustrated in FIGURE 6. The spring tongue 28 conveniently flexes between the flanges 16 and 17, as shown.

The resiliency of the material permits flexing the flanges 16 and 17 in an axial direction with respect to the trunnion pins 18 and 19 for mounting the cover in position. The trunnion pins 18 and 19 are rounded at the end for conveniently snapping into the openings 23 and 24 when the flanges 16 and 17 are forcibly moved together and the ears 21 and 22 of the cover slid down outwardly of the ends of the trunnion pins 18 and 19.

The cover may be made of various materials and may be formed of metal, although it also may be of a molded plastic. As will be appreciated, while the preferred arrangement is illustrated the position of the elements may be reversed with trunnion pins carried on the cover and openings provided in the flanges. The trunnion pins may also be constructed to project inwardly, although the present arrangement is preferred.

It will also be understood that the features of the integral tongue spring 28 may be employed with other pivotal support arrangements for the cover. By constructing the housing as a one piece integral unit with the flanges 16 and 17 and the spring tongue being integral therewith and having resilient characteristics, the aforescribed advantages of assembly and operation are obtained, along with the advantage of being able to construct the housing with its attached elements in a single manufacturing operation.

In the manufacture of the spring tongue, the tongue is constructed so that it will be prestressed for the desired resilience, and variation in resilience can be obtained by the thickness and widths of the tongue and variation in the depth of the notches in the wall beside the tongue. It has been found that for determining the dimensions for prestressing and obtaining the proper resiliency, with the use of a plastic as above described the factors for music wire may be conveniently and satisfactorily employed.

The drawings and specification present a detailed disclosure of the preferred embodiments of the invention, and it is to be understood that the invention is not limited to the specific forms disclosed, but covers all modifications, changes and alternative constructions and methods falling within the scope of the principles taught by the invention.

I claim as my invention:

1. An oil cup assembly comprising an oil cup housing with a cylindrical wall defining an oil flow chamber therein with a filling opening at the top, a cover on the top of the housing for closing the opening, means pivotally supporting the cover on said housing, a resilient spring tongue projecting upwardly from the wall in an unstressed position and bent outwardly and downwardly

in a prestressed operating position, and a spring engaging surface on the cover engaged by said tongue for urging the cover to closed position.

2. An oil cup assembly comprising an oil cup housing with a cylindrical wall defining an oil flow chamber therein with a filling opening at the top, a cover on the top for closing the opening, means pivotally mounting the cover on the cup housing, a resilient spring tongue projecting upwardly from the wall in an unstressed position and bent outwardly and downwardly in a prestressed operating position past a position forming an angle of 45° with the vertical unstressed position of the spring tongue, said tongue having a characteristic wherein it will pass its yield point and become prestressed at said 45° position, and a spring engaging surface on the cover engaged by said spring tongue for urging the cover to closed position.

3. An oil cup assembly comprising an oil cup housing with a wall having an inner surface and defining an oil flow chamber therein and a filling opening, a cover for closing said opening, means pivotally supporting the cover on said housing, and a resilient spring member integral and of one piece with the housing wall engaging the cover and urging it to closed position, the cover engaging surface of the spring being a continuation of the inner surface of the wall.

4. An oil cup assembly comprising an oil cup housing with a wall having an inner surface and defining an oil chamber therein and a filling opening and being formed of an acetal resin polymer of a thermoplastic, a cover for closing said opening, means pivotally supporting the cover on said housing, and a resilient spring member integral and of one piece with the housing wall formed of said acetal resin polymer engaging the cover and urging it to a closed position, the cover engaging surface of the spring being a continuation of said inner surface of the wall.

5. An oil cup assembly comprising an oil cup housing with a wall having an inner surface and defining an oil flow chamber therein and a filling opening formed of a resilient plastic material, a cover for closing said opening, means pivotally supporting the cover on said housing, and a resilient spring tongue integral and of one piece with the housing wall being formed of said resilient plastic material engaging the cover and urging it to closed position, the cover engaging surface of the tongue being a continuation of said inner surface of the wall.

References Cited in the file of this patent

UNITED STATES PATENTS

1,121,392	Organ	Dec. 15, 1914
1,498,479	Paganitsa	June 17, 1924
1,523,708	Nolan	Jan. 20, 1925
1,597,895	Illig	Aug. 31, 1926
1,707,128	McDonough	Mar. 26, 1929
1,794,987	Sebolt	Mar. 3, 1931
2,715,949	Nolan	Aug. 23, 1955
2,852,054	Motley	Sept. 16, 1958
2,960,254	Kiba	Nov. 15, 1960

FOREIGN PATENTS

2,162	Great Britain	of 1906
3,446	Great Britain	Feb. 12, 1907
629,858	Great Britain	Sept. 29, 1949