April 8, 1947. L. P. JANSON 2,418,646

LUBRICANT-COOLANT COLLAR OR RING

Filed Feb. 29, 1944

Fig. 1.

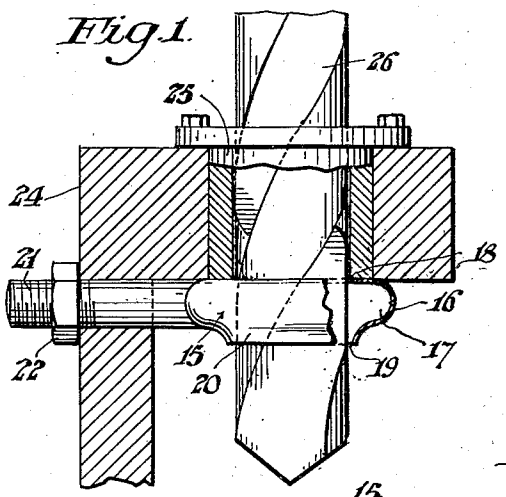


Fig. 3.

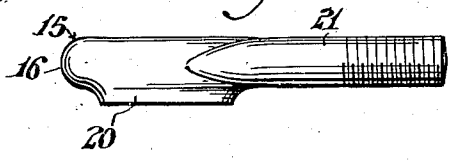


Fig. 2.



Fig. 4.



Fig. 5.

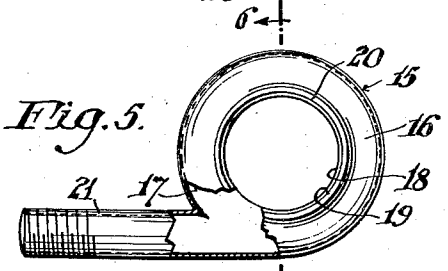


Fig. 6.

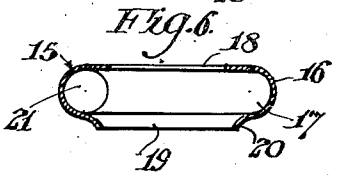


Fig. 7.

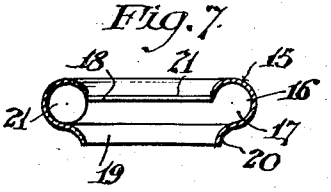


Fig. 8.

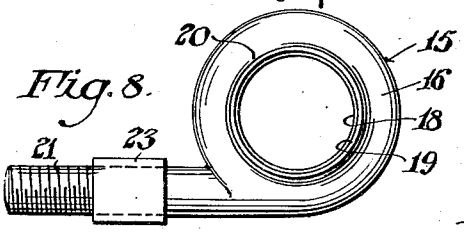
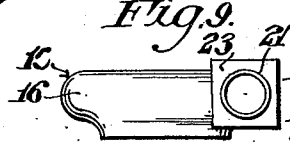


Fig. 9.



Inventor:
Leo Paul Janson,
By W. W. Williamson
Attorney.

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LUBRICANT-COOLANT COLLAR OR RING

Leo Paul Janson, Sharon Hill, Pa.

Application February 29, 1944, Serial No. 524,469

9 Claims. (Cl. 77—55)

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My invention relates to a new and beneficial lubricant-coolant collar or ring for use in connection with drills, reamers, cutters and similar tools, particularly high speed rotating or revolving tools for various purposes, and has for one of its objects to provide a simple and relatively inexpensive device of this character to direct a fluid or compound, having either or both lubricating and cooling qualities, around and straight down the tool to effectively provide a moving or flowing film of fluid over all of the working surface or surfaces of the tool with which the device is employed. The compound referred to is often defined as a cutting compound and in shop parlance is generally known as "soup."

Another object of the invention is to provide an exceedingly simple and efficient means for concentrating a fluid upon drills, reamers, cutters and various other types of tools, and the work or job being operated upon, and also in connection with vertical milling where the use of a coolant and/or lubricant is necessary or desirable.

It has been ascertained that an even, heavy and concentrated flow of the fluid used upon drills, reamers, cutters, and like tools, will prolong the life of such tools and eliminate or reduce to a minimum the likelihood of breaking or burning the tools due to poor, uneven or improper application of the fluid to the tools used in connection with their particular class of work. Therefore, another object of this invention is to overcome the disadvantages generally experienced with the present day methods of directing a stream or streams of a fluid at or onto a tool, often in a haphazard manner.

Also it has been ascertained that upon reaching the required depth of a drilling or reaming operation and the subsequent release and raising of the manually or automatically operated drill or reamer, the downward rush of a concentrated flow of fluid will wash out and carry off chips that have accumulated on the tool and in or on the workpiece within the path of travel of the fluid, thus saving time by rapidly making ready for the next operation of the tool. Therefore, another object of the present invention is to provide means to cause a flow of fluid in a concentrated fashion that will have sufficient force to remove chips from the work and thereby

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produce clean, high grade products at a considerable saving of time.

A highly important feature of this invention is that it will permit a steady, forceful flow of fluid in concentrated form over the tool and work at all times and thereby eliminate the necessity of turning on and off, by means of valves, the flow of fluid before and after each drilling and reaming operation, thus eliminating much lost motion, and therefore is very valuable, especially in connection with production work.

This method of heavily concentrating the lubricant-coolant fluid constantly and evenly upon the tool and work will make possible the operation of tools or cutters at a higher rate of speed than usual without the danger of burning or breaking such tools, which dangers are encountered in the use of other methods.

A further object of the invention is to provide a lubricant-coolant collar or ring for connection to a suitable support adjacent the tool and comprising a circlet of concavo-convex cross section preferably with an annular lip at the bottom and having a tangential inlet nipple communicating with the channel formed by the shape of the circlet.

A still further object of this invention is to provide the circlet, constituting the body of the collar or ring, with an inturned annular rim or baffle at the upper end thereof.

Still another object of the invention is to provide the inlet nipple with a non-circular portion functioning as a key to prevent shifting of the circlet about the axis of the nipple.

With the above and other objects in view, this invention consists of the details of construction and combination of elements hereinafter set forth and then designated by the claims.

In order that those skilled in the art to which this invention appertains may understand how to make and use the same I will describe its construction in detail referring by numerals to the accompanying drawing forming a part hereof, in which:

Fig. 1 is a sectional elevation of a guide for a drill showing my lubricant-coolant collar or ring assembled in operative position and a portion broken away to illustrate details of construction.

Fig. 2 is a side elevation or edge view of the

collar or ring constituting one form of my invention.

Fig. 3 is a similar view from a diametrically opposite position.

Fig. 4 is a like view at right angles to both Figs. 2 and 3 and looking towards the left hand side of Fig. 3.

Fig. 5 is a bottom plan view of the collar or ring.

Fig. 6 is a section on the line 6—6 of Fig. 5.

Fig. 7 is a similar view of a modification.

Fig. 8 is a bottom plan view showing a nipple with a non-circular portion or key.

Fig. 9 is an edge view thereof looking at the end of the nipple.

In carrying out my invention as herein embodied 15 represents the lubricant-coolant collar or ring including a circlet 16 of concavo-convex cross section providing an annular channel 17 around the inside. The collar, of course, is open at the top and bottom, as indicated at 18 and 19, respectively, and the opening 19, preferably, is larger than the opening 18. The lower opening 19 functions as an outlet and, preferably, is formed by the provision of an annular lip 20 blending with the lower part of the circlet to produce an ogee formation in cross section. The edge of the circlet about the top opening 18 is to be spaced a very slight distance from the surface of the tool with which the collar is used in order to limit the amount of fluid that might have a tendency to squirt upward.

In order to practically eliminate the possibility of any of the fluid escaping through the top opening, the circlet is provided with an inturned annular rim, flange or baffle 21, Fig. 7, and preferably, but not essentially, this rim is arcuate in cross section and follows the general curvature of the circlet. Said rim or baffle functions to direct the fluid downwardly and towards the tool which is surrounded by the ring or collar.

A nipple 21 is carried by the circlet and communicates with the interior thereof or the channel 17 and said nipple, preferably, is arranged tangentially to the circlet to reduce friction between the flowing liquid and the walls of the circlet. The outer end of the nipple is threaded to receive a nut 22 and a portion of said nipple may be of non-circular formation as at 23, Figs. 8 and 9, to prevent rotation of the nipple, after the manner of a key, and thus maintain the ring or collar in proper adjusted position.

In practice the lubricant-coolant collar or ring is mounted on a suitable support, such as a guide, jig, fixture or part of a machine, and for purposes of illustration only, I have shown the collar or ring mounted on a drill guide 24 with the circlet in axial alignment with the bushing 25 or the drill 26 or other tool. The mounting is accomplished by passing the nipple 21 through a hole and screwing the nut 22 in place. A liquid feed pipe from a source of supply or an element of a fluid circulating system is then attached to the exposed end of the nipple and the device is ready for use.

This simple mounting expedient is desirable because a distinct size of collar is to be used in connection with a particular size of tool or slight variations thereof and therefore a change has to be made when one tool is replaced by another of a different size. Further, each time a collar is changed or removed the fluid system or feed pipe will have to be detached and reconnected.

The liquid flowing through the lubricant-coolant collar or ring can be allowed to run continuously because said fluid is directed generally downward and inward towards the tool in a concentrated stream and therefore will not produce a spray which splashes about and causes loss of liquid as well as wetting the clothing of the operator.

Many other advantages accrue from the use of this device as will be obvious to those skilled in this art and among these advantages, in particular, is the saving of time, labor and material and a resultant high class of work.

Of course I do not wish to be limited to the exact details of construction herein shown and described as these may be varied within the scope of the appended claims without departing from the spirit of my invention.

Having described my invention what I claim as new and useful is:

1. A lubricant-coolant collar or ring comprising a circlet having a channel about the inner circumference thereof as the only liquid passageway, an annular lip protruding from the lower end of the circlet, and a nipple on the circlet and communicating directly with the channel.

2. The structure of claim 1 wherein the nipple is positioned tangentially to the circlet.

3. The structure of claim 1, in combination with an inturned rim at the upper end of the circlet.

4. A lubricant-coolant collar or ring including a circlet to surround a rotating cutting tool and open from end to end to permit longitudinal movement of the tool through said circlet, said circlet being of concavo-convex cross section to provide an annular channel on the inside thereof, the upper portion of the circlet adapted to lie in close proximity to the tool and the lower portion being spaced a greater distance from the tool to act as an outlet for directing a concentrated stream of fluid generally downward and towards the tool, and a nipple for mounting the collar on a support and providing a fluid inlet to the channel of the circlet.

5. The structure of claim 4 wherein a portion of the nipple is of non-circular shape.

6. As an article of manufacture, a lubricant-coolant collar consisting of a circlet having an annular channel about the inner circumference thereof and provided with openings at the top and bottom of the same, the top opening being smaller than the bottom opening, and a nipple on the exterior of the circlet and communicating directly with the channel.

7. As an article of manufacture, a lubricant-coolant collar consisting of a circlet concavo-convex in cross section to provide an interior annular channel with an inlet leading thereto, an annular lip projecting from the lower end of said circlet to function as an outlet spout, and an annular inturned rim at the upper end of said circlet to function as a baffle.

8. A lubricant-coolant collar for use in connection with a rotating tool, such as a drill, reamer and vertical milling cutter, said collar comprising a liquid feed circlet disposed about the tool to direct liquid passing into the circlet downwardly and towards the tool so as to form a flowing film of liquid all around said tool and thence as a forceful stream onto a workpiece for washing away chips, and a liquid inlet nipple carried by the circlet and functioning as means to detachably fasten the collar to a support.

9. A lubricant-coolant collar or ring comprising a circlet to surround a rotary cutting tool and open from end to end to permit longitudinal

movement of the tool through the circlet, said circlet being of concavo-convex cross section to provide an annular channel on the inside thereof, the tool within the circlet forming a partial barrier to the open portion of said channel, and a fluid inlet leading directly to the channel at only one point.

LEO PAUL JANSON.

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