July 25, 1939. C. E. TIDEMAN 2,167,397

WATER-COOLED WIRE BLOCK

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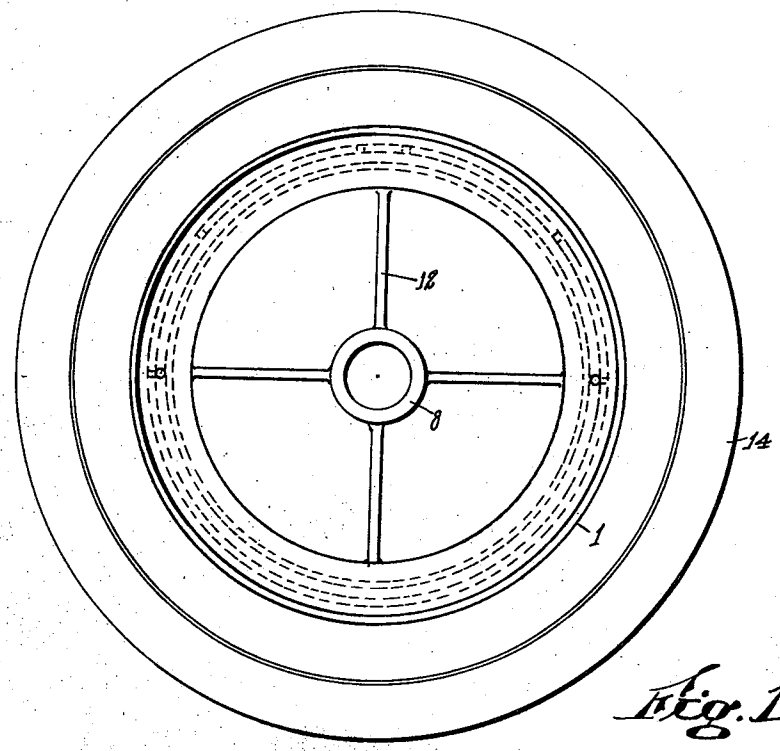


Fig. 1.

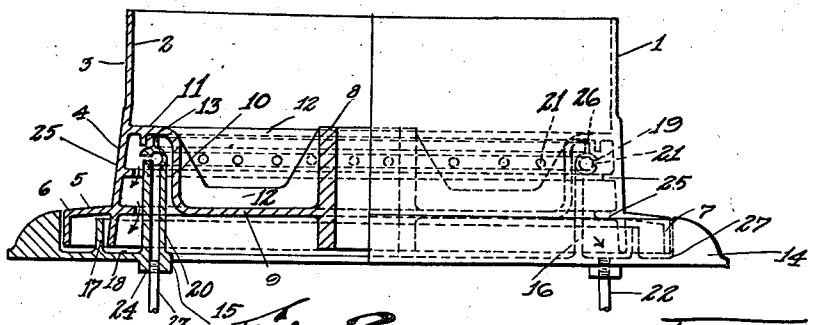


Fig. 2.

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WATER-COOLED WIRE BLOCK

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6 Claims. (Cl. 205—20)

The present invention relates to a water-cooled wire block for wire drawing machines and particularly to a block having associated therewith a structure by which cooling fluid is directed against the inside of the rim of the block opposite to the portion of the rim about which wire is coiled.

In prior devices of this character cooling fluid has been directed against the block by means of a ring-shaped nozzle positioned below the block and directing water upwardly against a portion of the inside of the block, as shown for example, in the Tideman Patent No. 1,497,959, dated June 17, 1924. In this patent the cooling fluid does not all reach the inner surface of the rim where the cooling action is required and as a result a relatively large amount of cooling fluid is necessary to assure a satisfactory cooling action. The principal object of the present invention is to provide for a more complete cooling of the rim of the wire block by directing the entire flow of fluid against the portion of the block where the cooling action is necessary.

To assure a more complete cooling of the wire block by the cooling fluid flowing over the inner surface of the rim, the present invention provides for the formation of inwardly extending cooling ribs on the inside of the rim which retard the downward movement of the cooling fluid on the rim and provide for more complete cooling thereof. These ribs also provide for reinforcement of the rim so that the rim thickness may be less and accordingly permit a more complete cooling of the outer surface of the rim.

Other and further objects and advantages of the invention will hereinafter more fully appear from the following detailed description taken in connection with the accompanying drawing in which—

Fig. 1 is a plan view of a block embodying the invention.

Fig. 2 is a sectional view through the block of Fig. 1.

Like reference characters refer to like parts in the different figures.

With reference to the drawing, and particularly to Fig. 2, the wire block 1 has a rim 2 having an outer substantially cylindrical surface 3 at the upper part thereof, and a slightly conical surface 4 below the surface 3. The wire as it comes from the die is wrapped around the surface 4, being guided onto the surface 4 by a substantially radially extending flange 5 having its outer surface 6 extending outwardly and slightly downwardly from the rim 2 at the lower edge of the surface 4. A cylindrical flange 7 extends downwardly from the outer edge of the flange 5. The rim 3 extends below the flange 5 for a purpose which will hereinafter appear.

The wire block 1 has a hub 8 integral with the rim of the block by which the block is secured to a suitable driving shaft, not shown. The hub has an integral radially extending flange 9 which, at its outer end, has a cylindrical flange 10 extending upwardly to a position substantially in line with the upper edge of the surface 4. A radial flange 11 integral with the rim connects the rim to the upper end of the cylindrical flange. Suitable reinforcing webs 12 may be provided between the hub and the cylindrical flange 10 for strengthening the block. Positioned inwardly of the rim 2, and on the underside of the radial flange 11, is a short downwardly extending flange 13 for a purpose which will be apparent later.

The block 1 is positioned above a ring 14 which may be an integral part of the base of the wire drawing machine, or which may be mounted on the upper side of the base, as desired. In either event the ring 14 has a central opening 15 and upwardly extending cylindrical flanges 16 and 17 concentric to the opening 15 and spaced apart to define a ring-shaped tank 18. The outer flange 17 is slightly larger in diameter than the rim 2 adjacent the bottom thereof to extend around the lower edge of the rim, and the inner flange 16 extends upwardly to a point just below the radial flange 11 of the block. It will be understood, of course, that the block and ring are held in predetermined relation to each other by positioning the supporting bearings for the drive shaft of the block in the base so that during rotation of the block the latter and the ring are in the relation shown in Fig. 2.

The upper end of the flange 16 has an annular chamber 19 to which fluid is directed by a hollow post 20 integral with the flange 16. Outwardly extending ports 21 intersecting the chamber 19 provide for the discharge of cooling fluid from the chamber radially outwardly against the inside of the rim adjacent to the upper part of the surface 4 of the rim, and the fluid flows down over the inner surface of the rim and into the tank 18. The cooling fluid is thus directed horizontally against the inside of the block so that it flows downwardly over the portion 4 of the rim about which the wire is coiled; the chamber 19 is thus located within the block as least as high as the lowermost edge of the portion of the block about which the wire is coiled. From the tank the cooling fluid passes through an outlet pipe 22 to a suitable collecting tank. A pipe 23 connecting to an inlet port 24

provides for the admission of cooling fluid to the hollow post 20. The chamber and openings 21 define a nozzle for directing the cooling fluid against the rim.

Inwardly extending radial flanges 25 are located on the inside of the rim 2 to retard the flow of cooling fluid downwardly into the collecting tank. The upper flange is positioned slightly below the openings 21, and the lower flange, which is somewhat wider, is in line with the radially extending flange 5. Through the action of the cooling fluid flowing over the flanges 25, the rim of the block about which the wire is coiled, is maintained at the desired low temperature without the necessity for an excessive volume of cooling fluid.

Splashing of the fluid adjacent the nozzles which are formed by the chamber 19 and openings 21 is limited by an upwardly extending flange 26 substantially in line with the flange 16. The flange 26 is slightly smaller in diameter than the depending flange 13, but in substantially the same radial plane, as will be apparent. Further splashing of the cooling fluid is prevented by the downwardly extending flange 7 on the block which extends into an annular recess 27 provided by the ring 14.

It will be understood that the circulating and cooling apparatus for the fluid, which is shown in applicant's copending application, Serial No. 208,633, filed May 18, 1938, may be incorporated in this device for more accurately controlling the temperature of the rim of the block.

I claim:

1. In wire drawing apparatus, a wire block rotatable on a substantially vertical axis and having a rim about which wire is coiled, and a stationary ring-shaped pipe positioned inside the block above the level of the lowermost part of the substantially cylindrical portion of the rim about which the wire is coiled and having nozzles for directing cooling fluid against the inner surface of the rim throughout the entire circumference thereof.

2. In wire drawing apparatus, a wire block rotatable on a substantially vertical axis and having a rim about which wire is coiled, and a stationary ring-shaped pipe positioned inside the block above the level of the lowermost part of the substantially cylindrical portion of the rim about which the wire is coiled and having nozzles for directing cooling fluid against the inner surface of the rim, said rim having at least one substantially horizontally extending flange over which the cooling fluid flows.

3. In wire drawing apparatus, a wire block rotatable on a substantially vertical axis and having a rim about which wire is coiled, and a nozzle positioned inside the block and arranged to direct cooling fluid horizontally against the inside of the rim, said rim having at least one substantially horizontal, inwardly extending annular flange over which the cooling fluid flows.

4. In wire drawing apparatus, a horizontally positioned wire block rotatable on a substantially vertical axis and having a rim about which wire is coiled, a base below the block having a ring-shaped collecting tank located beneath the rim, a ring-shaped nozzle positioned within the block above the level of the lowermost part of the substantially cylindrical portion of the rim about which the wire is coiled and a cylindrical flange integral with and extending between the nozzle and the base for supporting the nozzle above the base, said cylindrical flange having a channel therein for directing cooling fluid into the nozzle.

5. In wire drawing apparatus, a horizontally positioned wire block rotatable on a substantially vertical axis and having a rim about which wire is coiled, a base below the block having a ring-shaped collecting tank located beneath the rim, a ring-shaped nozzle positioned within the block above the level of the lowermost part of the substantially cylindrical portion of the rim about which the wire is coiled and a hollow post integral with and extending between the nozzle and the base for supporting the nozzle above the base and for directing cooling fluid into the nozzle, said nozzle being arranged to direct fluid horizontally against the inner surface of the rim.

6. In wire drawing apparatus, a horizontally positioned wire block rotatable on a substantially vertical axis and having a rim about which wire is coiled, a base below the block having a ring-shaped collecting tank located beneath the rim, a ring-shaped nozzle positioned within the block above the level of the lowermost part of the substantially cylindrical portion of the rim about which the wire is coiled and a cylindrical flange integral with and extending between the nozzle and the base for supporting the nozzle above the base, said cylindrical flange having a channel therein for directing cooling fluid into the nozzle, said nozzle being arranged to direct fluid substantially horizontally against the inner surface of the rim and said rim having substantially horizontal inwardly extending annular flanges on the inside thereof over which the cooling fluid flows.

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