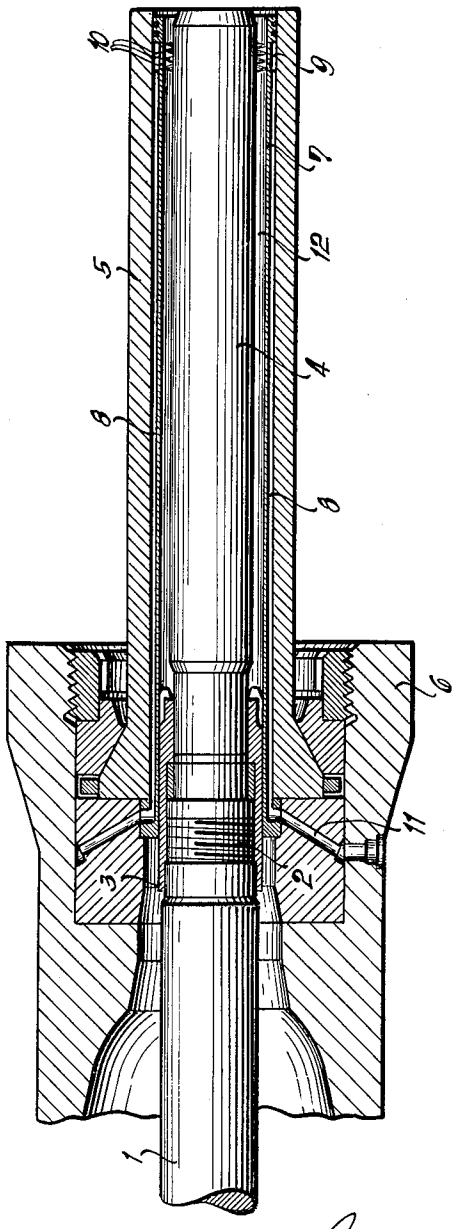
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MEANS FOR COOLING THE MANDREL OF AN EXTRUSION PRESS

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MEANS FOR COOLING THE MANDREL OF AN EXTRUSION PRESS

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This invention relates to cooling means for the mandrel, slidable in a hollow press ram, of a press for extruding metal tubes and rods. In practice it is usual to cool the mandrel in the simplest possible manner, by spraying it with water or smearing it with oil during its return stroke. Apart from the fact that access to the mandrel is usually hampered by various structural members of the press and accessories, a workman is required for this operation, or at least the member of the staff standing at the control desk must leave his place. Moreover cooling by means of oil is by no means sufficiently thorough, and cooling by spraying with water is very uneven. The object of this invention is therefore to provide cooling apparatus which is at the same time simple and requires no special operation, but which is also very uniform.

According to the invention, for the cooling of a press mandrel which is slidable in a hollow press ram, at least one annular groove is provided, which is in communication with a cooling-medium connection and is preferably arranged at the free end of the press ram, and which has nozzle-like bores directed radially towards the mandrel of the press. The cooling medium is according to the invention supplied to the annular groove by traversing the length of the press ram.

According to a further feature of the invention, a bush inserted into the press ram for the guidance of the mandrel is provided on its external peripheral surface with grooves extending parallel to the axis of the press ram and distributed around the periphery, these grooves opening into the annular groove or grooves provided at the head of the press ram, and having nozzle-like bores extending radially through the wall of the bush. Between the internal wall surface of the bush and the mandrel there is an annular space and the grooves communicate, at their ends remote from the head of the press ram, with a connection for the supply of cooling medium. According to the invention the supply of cooling medium can be automatically regulated in dependence upon the return movement of the mandrel and its temperature.

The apparatus according to the invention has the further advantage, in addition to that of most intensively cooling the highly stressed mandrel tip uniformly throughout its periphery, that the cooling medium, flowing throughout the length of the press ram, cools the latter at the same time.

One embodiment of the invention is illustrated by way of example in the accompanying drawing, in which only those details of an extrusion press that are necessary for the understanding of the invention are represented.

By 1 is denoted a mandrel-holder, which is connected by means of a screw-threaded socket 2 and a screwed-on sleeve 3, with a press mandrel 4 inserted in the sleeve 3. The mandrel 4 is inserted in a hollow press ram 5, the inner end of which is screwed, in a manner known in itself, to the platen 6 of the press. Into the press ram

5 is drawn a bush 7, which is provided on its external peripheral surface with peripherally distributed grooves 8 extending parallel to the axis of the press ram. At the free end of the press ram the grooves 8 open into an annular duct 9, which is provided with nozzle-like bores 10 extending radially through the wall of the bush 7 and directed towards the mandrel 4. At their ends remote from the free end of the press ram the grooves 8 communicate with an inlet 11 for cooling medium. The mandrel 4, which is slidable in the press ram 5, is guided over only a part of its length in the bush 7 by the sleeve 3. Over the rest of its length there is an annular space 12 between the internal wall surface of the bush 7 and the mandrel 4. The cooling, starting with the retraction of the mandrel, cools the mandrel progressively during its movement throughout its entire length, so that the mandrel tip is cooled in an especially energetic manner during the stoppage. An additional operating of the cooling apparatus is not required; it is automatically adjustable with the return of the mandrel. Simultaneously with the cooling of the mandrel, a cooling of the press ram 5 is effected by the cooling medium flowing in the grooves 8.

I claim:

1. In a press for the extrusion of metal tubes and the like comprising a hollow press ram and a mandrel slidable therein, means for cooling the mandrel, comprising a bush so arranged in the hollow ram as to provide a passageway between the ram and the bush and an annular space between the bush and the mandrel, means for the admission of cooling medium to the said passageway at the inner end of the press ram, and at least one nozzle ring near the free end of the press ram, the said passageway opening into the nozzle ring, and the nozzle ring being formed with radial bores directed towards the mandrel.

2. In a press for the extrusion of metal tubes or the like comprising a hollow press ram and a mandrel slidable therein, means for cooling the mandrel, comprising: a bush fitted into the press ram, leaving an annular space between the internal wall surface of the bush and the mandrel, the external surface of the bush being formed with peripherally distributed grooves parallel to the axis of the press ram, means for the admission of cooling medium to the said grooves at their ends adjacent to the inner end of the press ram, and at least one nozzle ring near the free end of the press ram, the said grooves opening into the nozzle ring, and the nozzle ring being formed with radial bores directed towards the mandrel.

3. A press for the extrusion of metal tubes and the like as claimed in claim 2, further comprising a mandrel-holder, and a sleeve positively connecting the mandrel with the mandrel-holder, this sleeve being slidably guided in the bush, so as to keep the mandrel co-axial with the bush and thereby maintain the annular space between them.

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