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(54) **Continuous casting machine dummy bar.**

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Description

The present invention relates to a bar for use as a dummy bar in a continuous casting machine, according to the first part of claims 1.

It is well known to use rigid dummy bars in the initial phase of a casting operation in a vertical, horizontal, or curved mould continuous casting machine. Such rigid bars are difficult to handle because they are usually very long, typically 10 to 20 m. Where different sizes are to be cast it is necessary to have a dedicated dummy bar for each size, or to use interchangeable taper adaptations at the mould end.

US Patent 4,043,383 discloses a dummy bar comprising a plurality of sub-bars each having a spigot on one end and a recess in the other end, so that sub-bars can be interconnected in series with the spigot of one sub-bar releasably engaging in the recess of the next sub-bar, in order to provide a dummy bar made up of a number of sub-bars.

In order to prevent working of the joints between the sub-bars when subject to the large reversing cyclic load in a continuous casting machine it is necessary for the joints between the sub-bars to be very stiff. Also for practical purposes, the joints need to be capable of being easily assembled and disassembled.

According to the present invention there is provided a dummy bar comprising a plurality of sub-bars each having a spigot on one end and a recess in the other end, so that the sub-bars can be interconnected in series, with the spigot of one sub-bar releasably engaging in the recess of the next sub-bar, in order to provide a dummy bar made up of a number of sub-bars and characterised by each sub-bar being provided with internally mounted hydraulic means adapted to be coupled with the next sub-bar and operable to urge the sub-bars together to ensure a stiff interconnection.

Preferably the hydraulic means is in the form of a hydraulic piston and cylinder assembly mounted within one of the sub-bars, and interconnectable with the other sub-bar in use.

A preferred embodiment of the invention will now be described, by way of example, with reference to the accompanying drawings, wherein :

Figure 1 is a cross-sectional view through two adjacent sub-bars of a dummy bar prior to interconnection ;

Figure 2 is a similar view to Figure 1 but with the two sub-bars of the dummy bar interconnected.

Referring first to Figure 1, a dummy bar is made up of series of sub-bars the ends of only two of which are shown. The end of one sub-bar 1 has a spigot 2 with a notch 3. Within the sub-bar 1 is a chamber 4 in which slides a piston 5 connected to a rod 6 which projects through the spigot 2 and at the end of the rod 6 is an eye 7. In the end of the other sub-bar 10 is a

recess 11 with a secondary recess 12 at the back of the recess 11. Transversely through the sub-bar 10 extends a hole 13 which meets the sub-recess 12. Also there is an inclined threaded hole 14 joining the recess 11, which receives a grub screw 15. The hole 13 through the sub-recess 12 receives a pin 16, in use.

It is to be appreciated each sub-bar has at one end a spigot and associated piston cylinder assembly, and recesses with associated holes at its other end.

The interconnection of two sub-bars will now be described, first hydraulic pressure is applied to the chamber 4 in the sub-bar 1 to move the piston and associated rod 6 to the right as shown in the Figures where the rod 6 projects from the spigot 2. The eye of the rod 6 is positioned in the sub-recess 12 in the other sub-bar 10 and the pin 16 inserted into the hole 13 to interlock the rod 6 and sub-bar 2. By applying hydraulic fluid to the opposite part of the chamber 4, i.e. the right hand side of the piston 5, the two sub-bars will be drawn together so that the spigot 2 engages in the recess 11. It is appreciated that by means of the hydraulic piston cylinder arrangement the two sub-bars can be brought together firmly. While still being held tightly together by the hydraulic pressure the grub screw 15 is tightened into the notch 3 in the spigot 2 to secure the two sub-bars 1 and 10 together, this is a situation illustrated in Figure 2.

The two sub-bars can be separated by a reverse procedure involving removing the pin 16 and applying hydraulic pressure into the left hand side of the chamber 4 to move the piston and piston rod to the right as shown in (Figure 2), thereby separating the two sub-bars from one another.

Claims

1. A dummy bar for use in a continuous casting machine comprising a plurality of sub-bars (1, 10) each having a spigot (2) on one end and a recess (11) in the other end, so that the sub-bars (1, 10) can be interconnected in series, with the spigot of one sub-bar releasably engaging in the recess of the next sub-bar, in order to provide a dummy bar made up of a number of sub-bars, characterised by each sub-bar (1, 10) being provided with internally mounted hydraulic means adapted to be coupled with the next sub-bar and operable to urge the sub-bars together to ensure a stiff interconnection.

2. A dummy bar according to claim 1 characterised in that fastening means is provided to secure the spigot of one sub-bar in the recess of the adjacent sub-bar after interconnection.

3. A dummy bar according to claim 2 characterised in that the fastening means comprises a screw (15) threadedly mounted, at an angle inclined to the axis of the dummy bar, in the body of the sub-bar defi-

ning the recess, to extend into the recess and engage in a notch (3) provided in the spigot (2) received therein in order to secure the sub-bars together.

4. A dummy bar according to any preceding claim characterised in that the hydraulic means comprises a piston (8) and cylinder (4) assembly mounted within one of the sub-bars, a rod (6) extending from said piston (4) and a securing pin (16) whereby the end of the rod (6) remote from the piston is secured within the next sub-bar.

Ansprüche

1. Anfahrstrang zur Verwendung in einer Stranggießanlage, mit mehreren Untersträngen (1, 10), von denen jeder einen Zapfen (2) an dem einen Ende und eine Ausnehmung (11) an dem anderen Ende besitzt, so daß die Unterstränge (1, 10) miteinander in Reihe verbunden werden können, wobei der Zapfen des einen Unterstranges lösbar in die Ausnehmung des nächsten Unterstranges eingreift, um einen aus einer Anzahl von Untersträngen gebildeten Anfahrstrang zu bilden, dadurch gekennzeichnet, daß jeder Unterstrang (1, 10) mit intern angeordneten Hydraulikmitteln versehen ist, die mit dem nächsten Unterstrang koppelbar sind und die Unterstränge zusammenschieben, um eine steife Verbindung zu gewährleisten.

2. Anfahrstrang nach Anspruch 1, dadurch gekennzeichnet, daß Befestigungsmittel vorgesehen sind, um den Zapfen des einen Unterstranges in der Ausnehmung des benachbarten Unterstranges nach der Verbindung zu sichern.

3. Anfahrstrang nach Anspruch 2, dadurch gekennzeichnet, daß die Befestigungsmittel eine Schraube (15) umfassen, die in einem zur Achse des Anfahrstranges geneigten Winkel in dem die Aussparung bildenden Körper des Unterstranges schraubbar befestigt ist, um sich in die Ausnehmung zu erstrecken und in eine im Zapfen (2) ausgebildeten Kerbe (3) einzugreifen, um die Unterstränge aneinander zu befestigen.

4. Anfahrstrang nach einem vorangegangenen Anspruch, dadurch gekennzeichnet, daß die Hydraulikmittel eine innerhalb eines der Unterstränge befestigte Anordnung aus Kolben (5) und Zylinder (4), eine sich vom Kolben (5) erstreckende Stange (6) und einen Sicherungsstift (16) umfassen, wodurch das vom Kolben entfernte Ende der Stange (6) innerhalb des nächsten Unterstranges gesichert wird.

Revendications

1. Fausse barre pour une machine à coulée continue qui comprend un certain nombre de sous-barres (1, 10) possédant chacune un tourillon (2) à une extré-

mité et une cavité (11) à l'autre, ce qui fait que ces sous-barres (1, 10) peuvent être interconnectées en série, en ce que le tourillon d'une sous-barre s'engage, de manière séparable, dans la cavité de la suivante, afin de produire une fausse barre composée d'un certain nombre de sous-barres, caractérisée en ce que chaque sous-barre (1, 10) est pourvue intérieurement de moyens adaptés à être reliés à la sous-barre suivante et pouvant être actionnés pour solliciter les sous-barres l'une vers l'autre afin d'assurer une interconnexion rigide entre elles.

2. Fausse barre selon la revendication 1, caractérisée en ce que des moyens de fixation sont prévus pour fixer le tourillon de l'une des sous-barres dans la cavité de la sous-barre adjacente après l'interconnexion.

3. Fausse barre selon la revendication 2, caractérisée en ce que les moyens de fixation comprennent une vis (15) vissée dans un taraudage avec une certaine inclinaison par rapport à l'axe de la fausse barre, dans le corps de celle-ci définissant la cavité, de façon à pénétrer à l'intérieur de la cavité en s'engageant dans une encoche (3) formée dans le tourillon (2) en solidarissant ainsi les deux sous-barres.

4. Fausse barre selon l'une quelconque des revendications précédentes, caractérisée en ce que les moyens hydrauliques comprennent un piston (8) et un cylindre (4) montés dans l'une des sous-barres, une tige (6) s'étendant dudit piston (4) et une goupille de fixation (16), ce qui fait que l'extrémité de la tige (6) située à l'opposé du piston est fixée dans la sous-barre suivante.

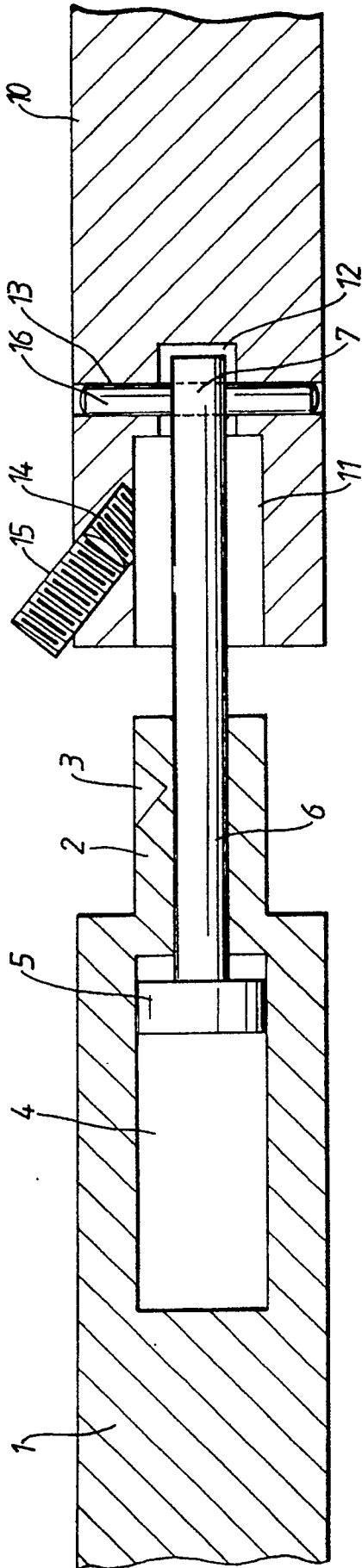


Fig.1.

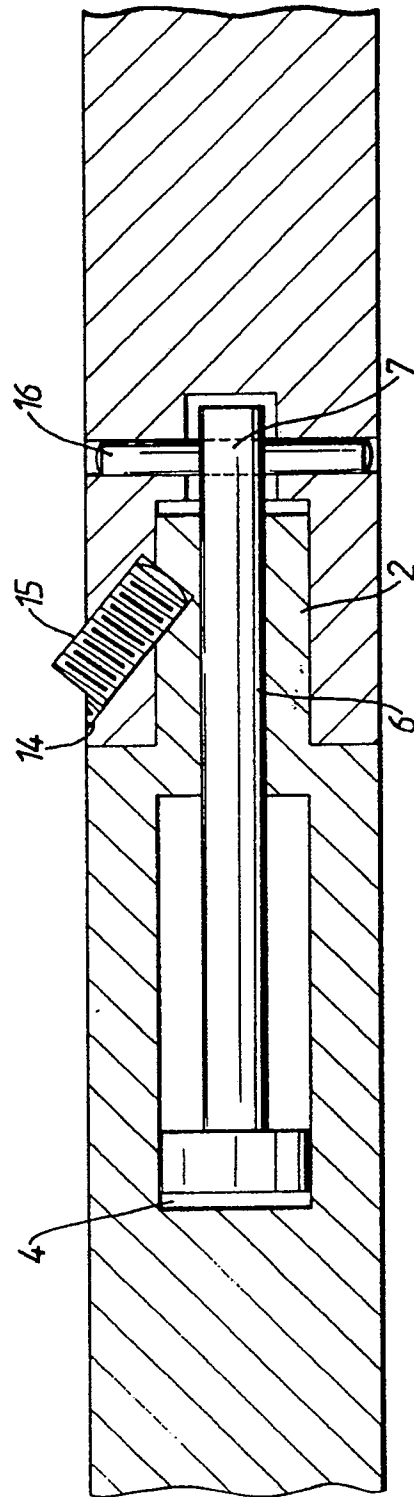


Fig.2.