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(54) **HYDRAULIC HAMMER**

HYDRAULISCHER HAMMER

MARTEAU HYDRAULIQUE

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Description

[0001] The present invention relates to a hydraulic hammer according to the preamble of claim 1. Such a hydraulic hammer is known from US 2012/138328 A1.

[0002] This invention relates to the mining and construction industry, in particular, to hydraulic impact mechanisms, and is intended for use as removable equipment for construction and road-building machines for the destruction of coherent rocks, road surfaces, concrete structures and the like.

[0003] A hydraulic hammer containing a bushing, in the wall of which there are many passages for communication with the first set of holes and the second set of holes and the supply of fluid medium is known from the prior art. The passages contain a porous medium to ensure the flow of hydraulic fluid through it. The porous structure is a honeycomb structure used to increase surface area, which increases the heat dissipation rate (US 2017080554, March 23, 2017).

[0004] The disadvantage of this impact mechanism is the complexity and high cost of the structure, low efficiency, and the lack of heat removal directly from its source.

[0005] The submitted invention is intended to solve a technical problem, which is the expansion of the technical means of hydraulic hammers, the characteristics of which provide an effective, durable and reliable hydraulic hammer by reducing heat loads directly in the zone of their occurrence with a simple design.

[0006] The technical effect achieved by the implementation of this invention is an increase in the efficiency, durability, and reliability of operation of the hydraulic hammer by increasing heat transfer (provision of cooling) from the heating zone and lowering the temperature of both the sleeve and the hydraulic hammer as a whole without significantly complicating the design of the hydraulic hammer.

[0007] The specified technical effect is achieved by a hydraulic hammer according to claim 1 comprising a housing with pressure and drain holes and with a sleeve located in it, made with a pressure cut and a pressure hole, a head located in the sleeve and configured to reciprocate and interact with the working piece, pressure and drain lines, wherein the outer surface of the sleeve has circular cuts and two diametrically opposite longitudinal channels.

[0008] One of the longitudinal channels is connected to the pressure hole of the sleeve, and the other channel is connected to the pressure line through the pressure cut of the sleeve and the pressure hole of the housing.

[0009] In the bottom part on the outer surface of the head there is at least one circular groove with a seal installed in it.

[0010] Both longitudinal channels are configured to intersect with at least one circular cut of the sleeve.

[0011] Circular cuts and two diametrically opposite longitudinal channels made on the outer surface of the sleeve with a simultaneous increase in the area of the outer surface of the sleeve to accelerate heat dissipation, and the organization of the hydraulic fluid flow through them, eliminate overheating of the working surfaces of the sleeve preventing its failure, as well as failure of the head, the seals and the hydraulic hammer as a whole, which increases the efficiency, durability, and reliability of operation of the hydraulic hammer without significantly complicating the design of the hydraulic hammer.

[0012] The essence of the invention is explained in the drawings, where Fig. 1 shows a general arrangement of the hydraulic hammer; Fig. 2 shows section A-A in Fig. 1; Fig. 3 shows section B-B in Fig. 1.

[0013] Adopted designations:

1 - housing,
2 - sleeve,
3 - head,
4 - working piece,
5 - pressure hole,
6 - drain hole,
7 - pressure cut,
8 - circular cuts,
9 - first longitudinal channel,
10 - second longitudinal channel,
11 - pressure hole,
12 - circular grooves,
13 - seals,
14 - cocking cavity,
15 - pressure line,
16 - drain line.

[0014] The hydraulic hammer includes housing 1, sleeve 2, head 3 and working piece 4.

[0015] Pressure hole 5 and drain hole 6 are made in housing 1.

[0016] On the outer surface of sleeve 2 there is a pressure cut 7, cuts 8 and diametrically opposite first longitudinal channel 9 and second longitudinal channel 10. The wall of the sleeve has a pressure hole 11 connected to longitudinal channel 10.

[0017] In the lower part of head 3, there are circular grooves 12 in which seals 13 are installed.

[0018] Sleeve 2 is installed in housing 1. Head 3 is located in sleeve 2, where it reciprocates and forms a cocking cavity 14 with it.

[0019] Pressure hole 5 is connected to pressure line 15, and drain hole 6 is connected to drain line 16.

[0020] Working piece 14 is installed at the bottom of hydraulic hammer 4.

[0021] When operated, head 3 reciprocates. Due to friction of the head and seals 13 on the inner surface of sleeve 2, the parts are heated, which reduces the reliability of the hydraulic hammer.

[0022] To reduce the heat load, the actuating fluid from pressure line 15 flowing through pressure cut 7 and the first longitudinal channel 9 into the second longitudinal channel 10 and further through pressure hole 11 into the

cocking cavity 14 passes through cuts 8, washing the lower part of sleeve 2 and cooling it.

[0023] The claimed invention increases the range of hydraulic hammer capabilities and the efficiency, durability, and reliability of the hydraulic hammer operation.

Claims

1. A hydraulic hammer comprising a housing (1) with a pressure hole (5) and a drain hole (6), a sleeve (2) located in the housing (1), wherein said sleeve (2) comprises a pressure cut (7) and a pressure hole (11), a head (3) located in the sleeve (2) and configured to reciprocate and interact with an working piece (4), a pressure line (15) and a drain line (16), wherein the outer surface of the sleeve (2) has two diametrically opposite longitudinal channels (9, 10), wherein one of the longitudinal channels (10) is connected to the pressure hole (11) of the sleeve (2), **characterised in that** the outer surface of the sleeve (2) has circular cuts (8), and the other longitudinal channel (9) is connected to the pressure line (15) through the pressure cut (7) of the sleeve (2) and the pressure hole (5) of the housing (1), wherein both longitudinal channels (9,10) are configured to intersect with at least one circular cut (8) of the sleeve (2).

2. The hydraulic hammer of claim 1 wherein the bottom part on the outer surface of the head (3) having at least one circular groove (12) with a seal (13) installed in it.

Patentansprüche

1. Ein Hydraulischer Hammer, umfassend ein Gehäuse (1) mit einem Drucköffnung (5) und einem Ablaufloch (6), eine Hülse (2), die in dem Gehäuse (1) angeordnet ist, wobei die Hülse (2) einen Druckschnitt (7) und einem Drucköffnung (11) aufweist, einem Kopf (3), der in der Hülse (2) angeordnet ist, und dazu konfiguriert ist, sich hin und her zu bewegen und mit einem Werkstück (4) zusammenzuwirken, eine Druckleitung (15) und eine Ablaufleitung (16), wobei die Außenfläche der Hülse (2) zwei diametral gegenüberliegende Längskanäle (9, 10) aufweist, wobei einer der Längskanäle (10) mit dem Druckloch (11) der Hülse (2) verbunden ist, **dadurch gekennzeichnet, dass** die Außenfläche der Hülse (2) kreisförmige Schnitte (8) aufweist und der andere Längskanal (9) durch den Druckschnitt (7) der Hülse (2) und die Drucköffnung (5) des Gehäuses (1) mit der Druckleitung (15) verbunden ist, wobei die beiden Längskanäle (9, 10) so gestaltet sind, dass sie sich mit mindestens einem kreisförmigen Schnitt (8) der Hülse (2) kreuzen.

2. Ein Hydraulischer Hammer nach Anspruch 1, wobei das Bodenteil an der Außenfläche des Kopfes (3) mindestens eine kreisförmige Nut (12) mit einer darin eingebauten Dichtung (13) aufweist.

Revendications

1. Marteau hydraulique comprenant un boîtier (1) avec un orifice de pressurisation (5) et un orifice de drainage (6), un manchon (2) situé à l'intérieur du boîtier (1), dans lequel ledit manchon (2) comprend une découpe de pressurisation (7) et un trou de pressurisation (11), une tête (3) située à l'intérieur du manchon (2) et configurée pour aller et venir et interagir avec une pièce effectrice (4), une ligne de pressurisation (15) et une ligne de drainage (16), dans lequel la surface extérieure du manchon (2) a deux canaux longitudinaux diamétralement opposés (9, 10), dans lequel l'un des canaux longitudinaux (10) est connecté avec le trou de pressurisation (11) du manchon (2), **caractérisé en ce que** la surface extérieure du manchon (2) a des découpes circulaires (8) et l'autre canal longitudinal (9) est connecté à la ligne de pressurisation (15) à travers la découpe de pressurisation (7) du manchon (2) et l'orifice de pressurisation (5) du boîtier (1), dans lequel les deux canaux longitudinaux (9, 10) sont configurés pour se croiser avec au moins une découpe circulaire (8) du manchon (2).

2. Marteau hydraulique selon la revendication 1, dans lequel la partie inférieure de la surface extérieure de la tête (3) ayant au moins une gorge circulaire (12) avec un joint (13) installé dans celle-ci.

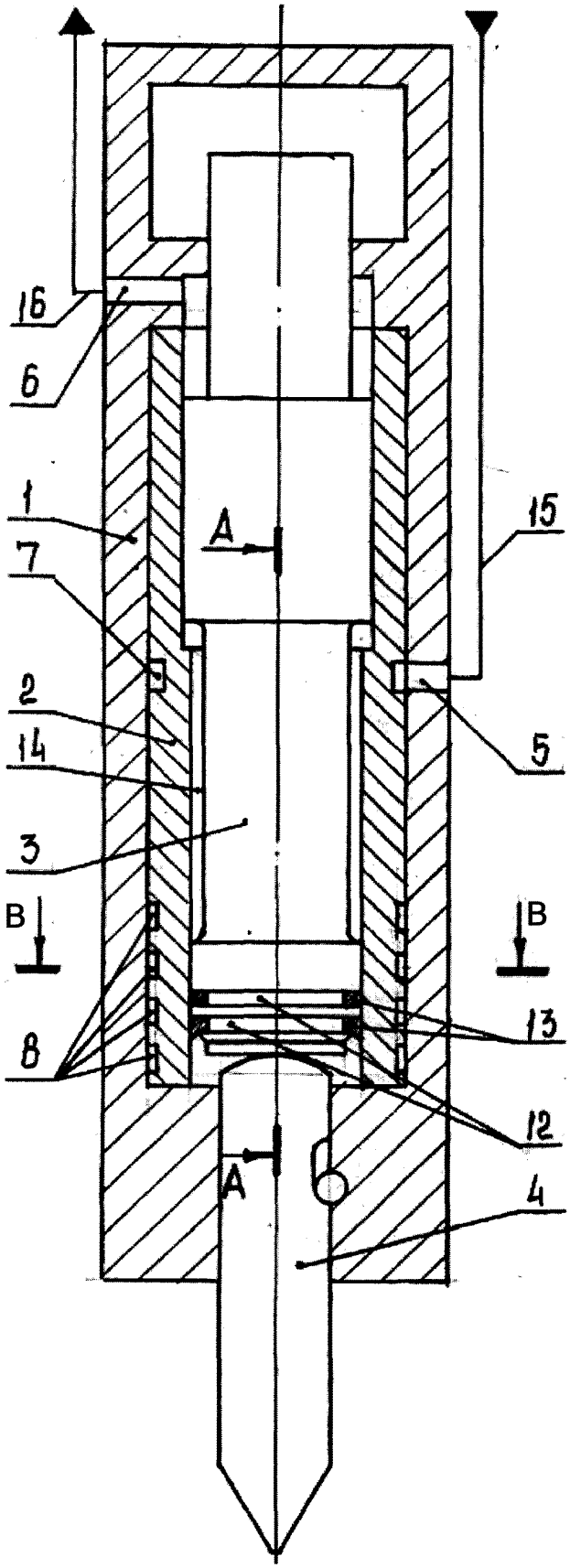

Figure 1

A-A

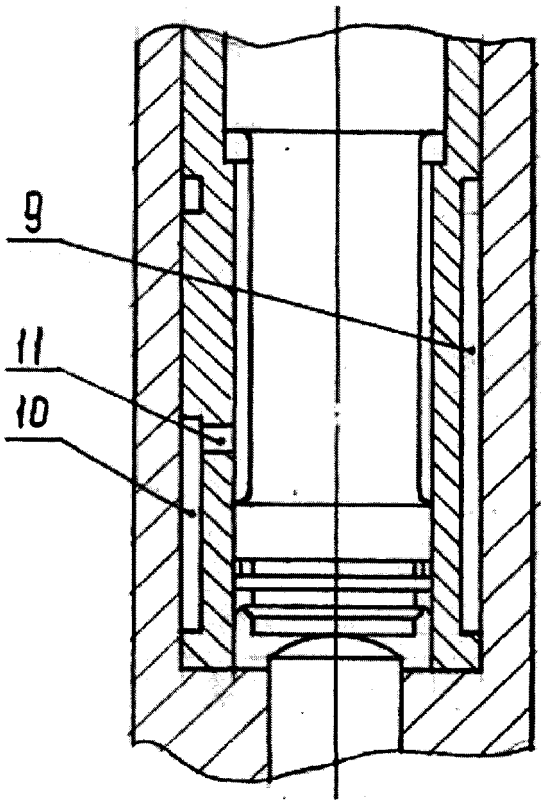

Figure 2

B-B

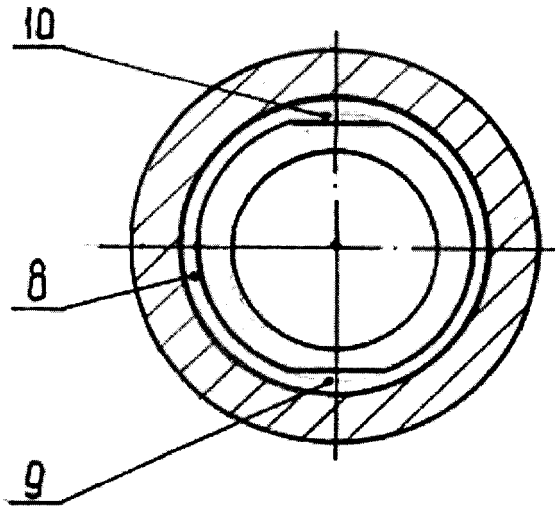

Figure 3

REFERENCES CITED IN THE DESCRIPTION

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