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(54) **WINDLASS ROPE SPOOLER UNIT**

(57) Rope spooler unit used for spooling the rope on the drum of the transport windlass, working together with the guide roller assembly which is detachably connected to the base. The spooler is controlled by the transport windlass (21) control unit and is detachably connected to the windlass substructure (8) from the side of rope (10) winding on the drum (9).

The device features a base (1) to the arms (17) and (17') of which ends (19) and (19') of the hydraulic cylinder

(2) with two-sided piston rod (4) are detachably fastened using pins (18) and (18'), and to the body (3) of the hydraulic cylinder (2) a damping ring (20) is fixed integrally, which is detachably connected to the rope (10) guiding rollers (5) assembly, and there is a strip (7) that prevents rotation of the cylinder body (3), the longitudinal axis (6) of the hydraulic cylinder (2) being parallel to the axis of rotation (12) of the transport windlass (21) drum (9).

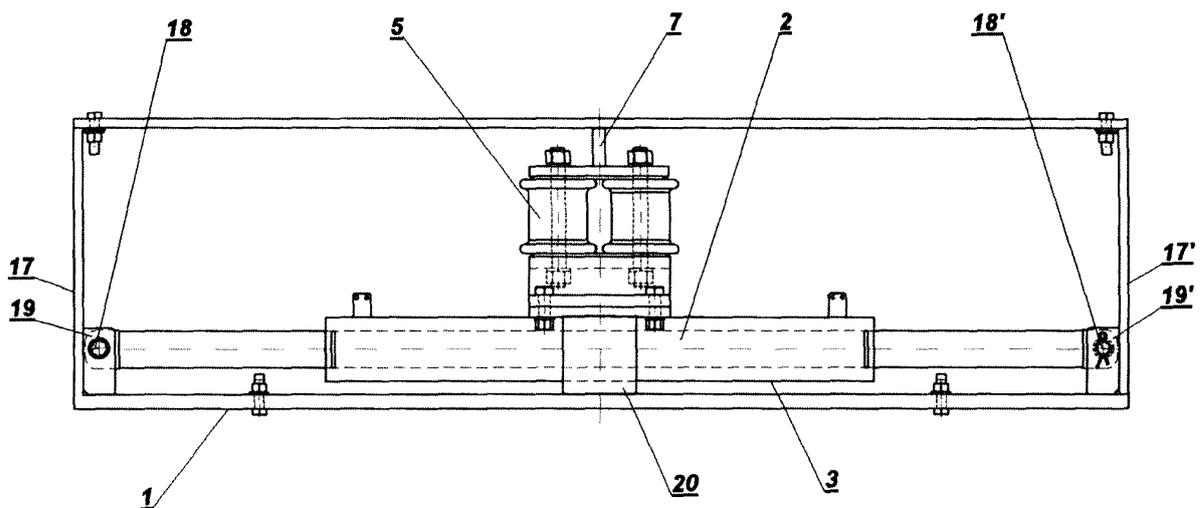


Fig. 4

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Description

[0001] The subject of the invention is a rope spooler unit for windlass designed to transport cargo using the hoisting rope in an open system in mining cross-cuts and workings inclined at an angle of 40° in potentially explosive methane atmosphere and in the workings with a coal dust explosion risk.

[0002] Known windlass rope spooler units used in mining windlasses are characterized by the fact that they are based on a separate structure using mechanical components, which consists of chains, gears and drive - often a manual one. These solutions often do not work well in difficult mining conditions and often do not provide a sufficiently large tractive force.

[0003] The present invention aims to provide a solution for rope spooler with a more robust design, thanks to the use of the compact enclosure which ensures the stability and durability of the unit, providing for rope spooling coil to coil and layer on layer.

[0004] The rope spooler unit used for spooling the rope on the drum of the transport windlass, working together with the guide roller assembly detachably connected to the base according to the invention is characterized in that it is controlled by the windlass control unit and is detachably connected to the windlass substructure from the side of rope winding on the drum, and it features a base to the arms of which ends of the hydraulic cylinder with two-sided piston rod are releasably fastened using pins, and to the body of the hydraulic cylinder, a clamping ring is fixed integrally, which is detachably connected to the rope guiding rollers assembly, and there is a strip that prevents rotation of the cylinder, the longitudinal axis of the hydraulic cylinder being parallel to the axis of rotation of the transport windlass drum.

[0005] An advantage of the rope spooler is uniform arrangement of the individual coils of the rope on the drum and the successive layers of the rope, whereby coils are adjacent to each other closely so that a rope of greater length can be wound on the drum, and the rope is neither deformed nor worn rapidly.

[0006] The subject of the invention is illustrated in the sample embodiment in the accompanying drawing, with fig. 1 showing the front view of the transport windlass equipped with rope spooler, fig. 2 showing a side view of the transport windlass equipped with rope spooler, fig. 3 showing a top view of the transport windlass equipped with rope spooler, fig. 4 showing the front view of the rope spooler, fig. 5 showing the side view of the rope spooler, and fig. 6 showing the top view of the rope spooler.

[0007] As shown in the figure, the rope spooler 11 is attached to the substructure 8 of the transport windlass 21 from the side of rope entry 10 to the drum 9 and is used for winding the rope 10 and the proper adjustment of rope 10 winding. It consists of a base 1 to the arms 17 and 17' of which ends 19, 19' are detachably mounted using pins 18, 18', and of the hydraulic cylinder 2 with two-sided piston rod 4, to the body 3 of which a clamp

20 is fixed integrally, to which a guide rollers assembly 5 guiding the rope 10 onto the drum 9 is detachably connected. The rope spooler assembly 11 does not require using a separate power supply unit, because it is integrated into the control system of the windlass 21, which enables controlling it directly from the main control panel. The rope spooler unit 11 is working together with a rope drum 9 assembly. After winding of the rope 10 on the drum 9 is started, there is a change in position of the rollers 5 correlated with the change in position of the hydraulic cylinder body 3. The cylinder 3, extending its piston rod 4 causes the linear movement of the cylinder 3 in either direction and thereby move the rollers 5 guiding the rope 10 on the drum 9 of the transport windlass 21. This enables uniform, multi-layered arrangement of rope 10 coils on the drum 9.

The transport windlass 21 also has a guiding roller 16 assembly, detachably connected to the base 8 of the windlass, placed behind the rope spooler 11. It is situated in such a way with respect to the lower edge of the cable drum 9 shell that the incoming rope 10 is continuously pressed against the drum 9 shell. This ensures constant coil-to-coil arrangement of the rope 10.

[0008] The longitudinal axis 6 of the hydraulic cylinder 2 is parallel to the axis of rotation 12 of the transport windlass 21 drum 9. Rollers 5 guiding the rope 10 on the drum 9 and the strip 7 that prevents cylinder body 3 rotation are fixed to the hydraulic cylinder 2 body 3.

[0009] The rope spooler 11 works together with a hydraulic power unit 13 which provides power for the brake assembly - the maneuvering brake 14 and the safety brake 15, so that the rope spooler 11 assembly does not require a separate power unit but it is integrated into the entire control system of the transport windlass 21. The rope spooler 11 assembly is equipped with a overflow valve 13 which limits the maximum pressure in the hydraulic system. The overflow valve 13 in the non-energized position allows free movement of the hydraulic cylinder 2 controlling the position of the rollers 5 guiding the rope 10. If one of the coils of the overflow valve 13 is energized, it allows the operator to adjust the position of the guide rollers 5, resulting in the appropriate winding of the rope 10 on the drum 9. An additional check valve of the overflow valve 13 prevents the return of oil to the pressure filter.

Claims

1. The rope spooler unit used for spooling the rope on the drum of the transport windlass, working together with the guide roller assembly detachably connected to the base **characterized in that** it is controlled by the transport windlass (21) control unit and is detachably connected to the windlass (21) substructure (8) from the side of rope (10) winding on the drum (9), and it features a base (1) to the arms (17) and (17') of which ends (19) and (19') of the hydraulic

cylinder (2) with two-sided piston rod (4) are detachably fastened using pins (18) and (18'), and to the body (3) of the hydraulic cylinder (2) a clamping ring (20) is fixed integrally, which is detachably connected to the rope (10) guiding rollers (5) assembly, and there is a strip (7) that prevents rotation of the cylinder body (3), the longitudinal axis (6) of the hydraulic cylinder (2) being parallel to the axis of rotation (12) of the transport windlass (21) drum(9).

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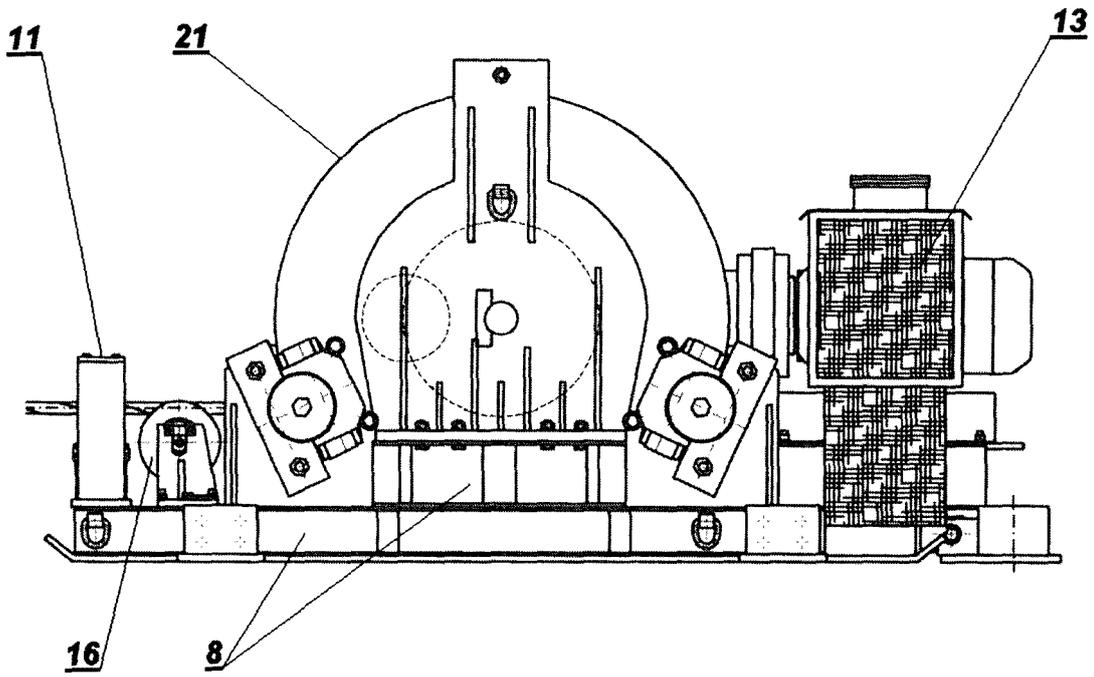


Fig. 1

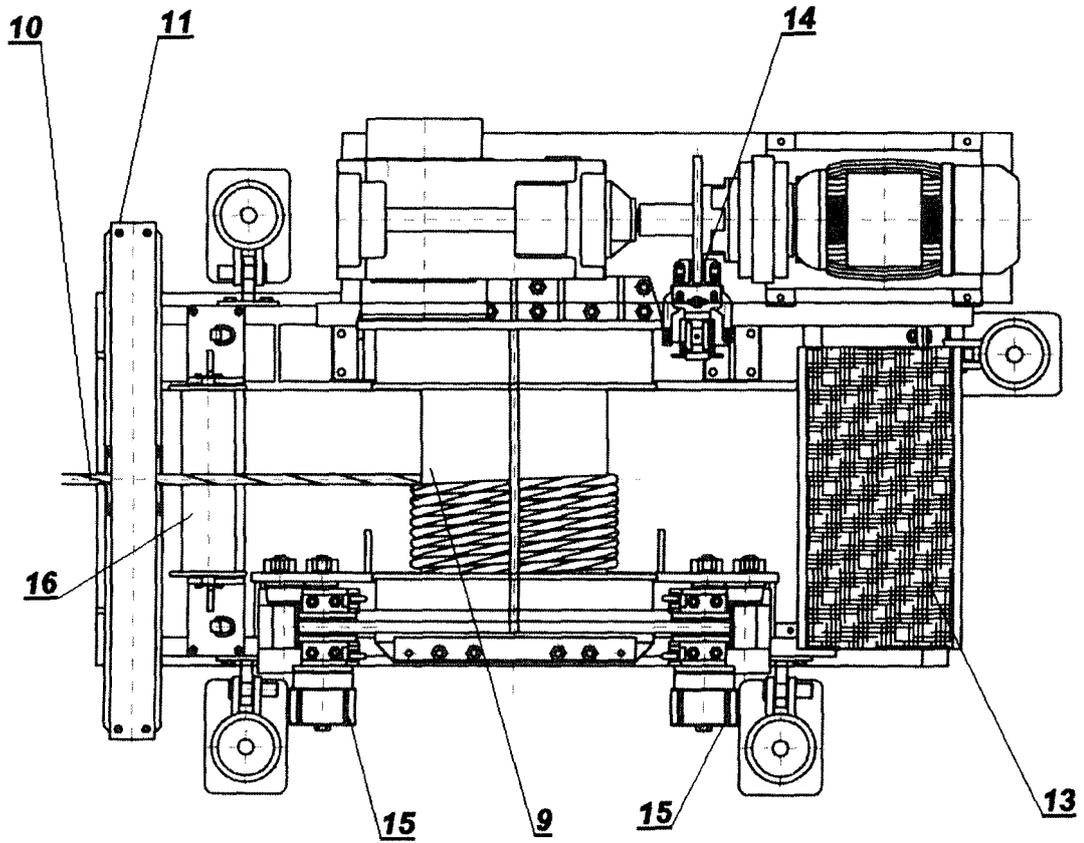


Fig. 3

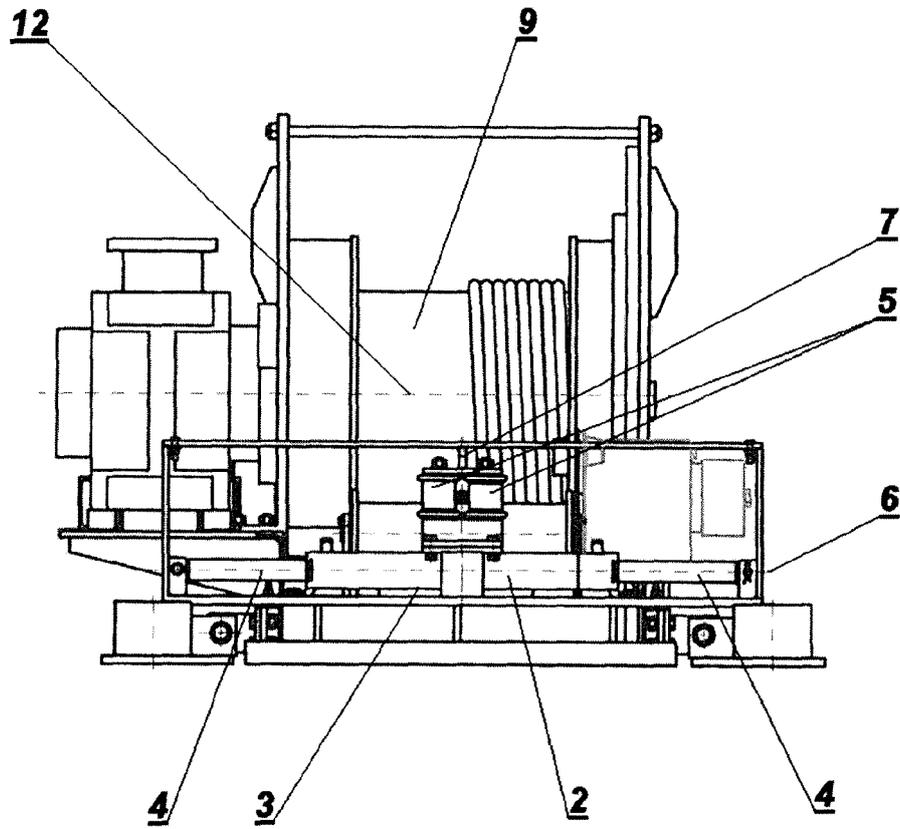


Fig. 2

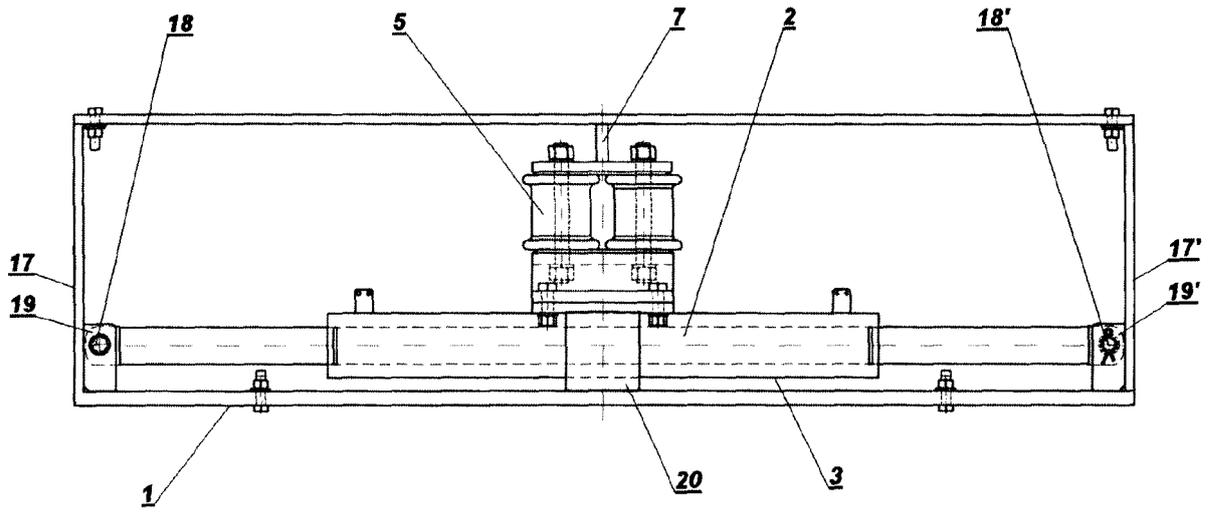


Fig. 4

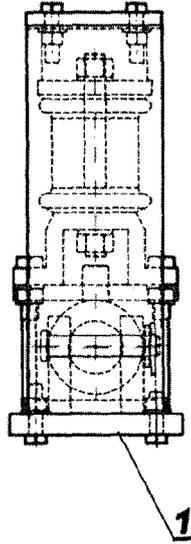


Fig. 5

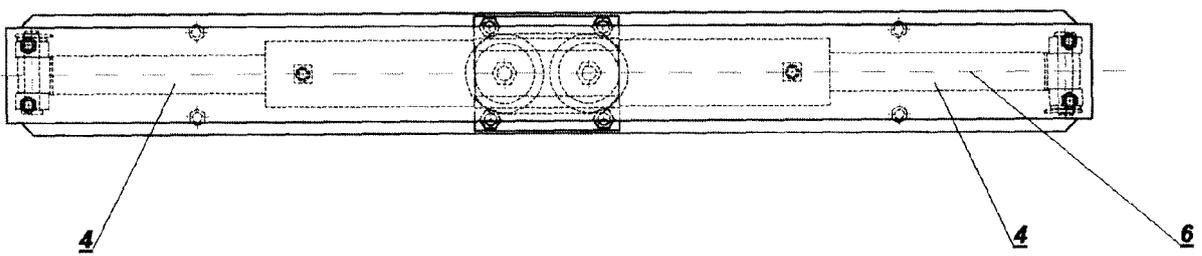


Fig. 6



EUROPEAN SEARCH REPORT

Application Number
EP 16 46 0047

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 6 910 679 B1 (VOGT DEWAYNE [US] ET AL) 28 June 2005 (2005-06-28) * column 2, line 36 - column 4, line 25; figures *	1	INV. B66D1/36
A	----- CH 658 041 A5 (BAERTSCHI & CO AG) 15 October 1986 (1986-10-15) * column 2, line 35 - line 53 *	1	
A	----- US 6 443 431 B1 (STASNY JAMES [US] ET AL) 3 September 2002 (2002-09-03) * abstract; figures *	1	
			TECHNICAL FIELDS SEARCHED (IPC)
			B66D
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		15 November 2017	Verheul, Omiros
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

1 EPO FORM 1503 03.02 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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15-11-2017

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