March 25, 1969 G. RODER 3,434,706

TRAVERSING CARRIAGE FOR METAL-BURNING CUTTING MACHINES

Filed Sept. 22, 1966 Sheet 1 of 3

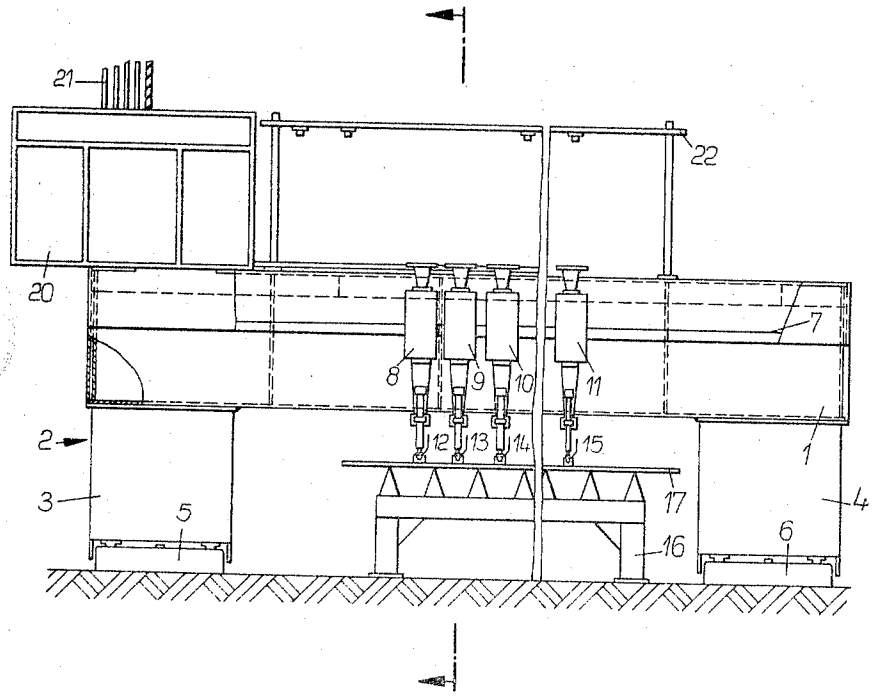

Fig. 1

Fig. 5

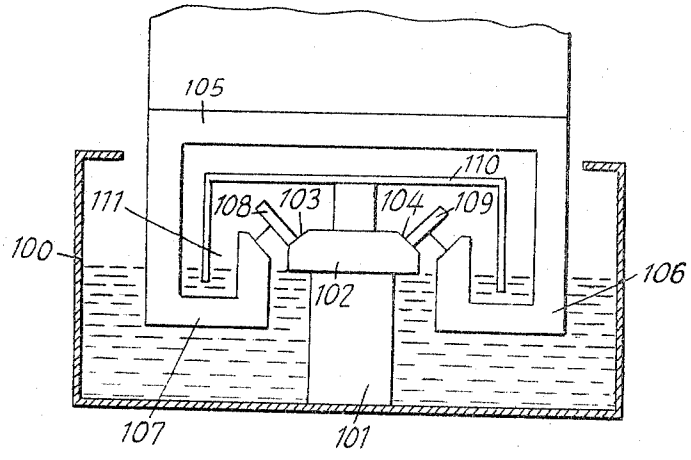

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Fig. 2

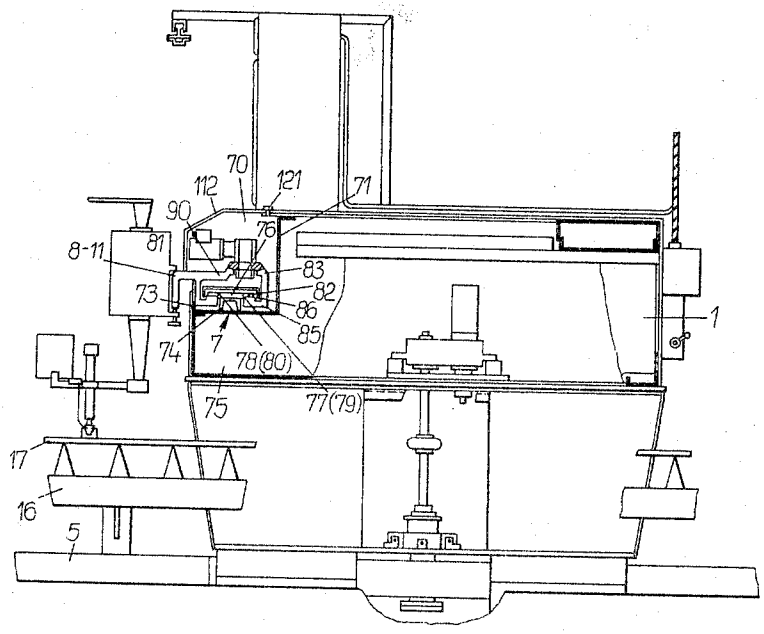

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Fig. 3

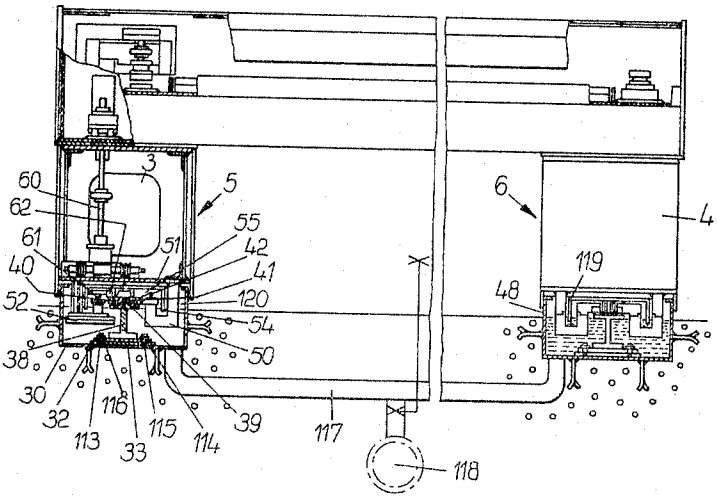
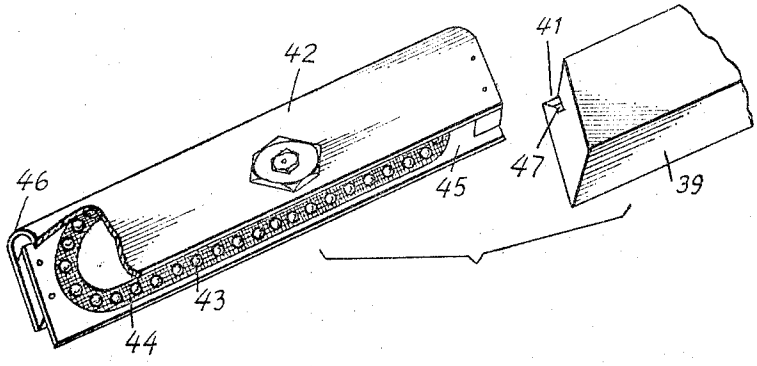


Fig. 4



United States Patent Office 3,434,706
Patented Mar. 25, 1969

3,434,706

TRAVERSING CARRIAGE FOR METAL-BURNING CUTTING MACHINES

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Filed Sept. 22, 1966, Ser. No. 581,269
Claims priority, application Germany, Sept. 24, 1965, M 66,761
Int. Cl. B23k 37/02
U.S. Cl. 266—23 5 Claims

ABSTRACT OF THE DISCLOSURE

A traversing carriage for a metal-burning cutting machine, which is mounted on the carriage, includes a liquid-sealed rail structure upon which the carriage is traversed for trapping any material against reaching the traversed mounting.

The present invention concerns the mounting of a traversing carriage for metal-burning cutting machines such as oxyacetylene cutters.

In use metal-burning cutters produce burnt metal ashes, metal dust and other waste. If precautions are not taken this waste works its way into the traverse mountings for traversing carriages, and in some circumstances can even be blown directly from the cutting area into such mountings. Guards are helpful in protecting the mountings, but the entire mounting area is generally so fouled and covered with dust that simple dust guards are not sufficient.

The function of the cutter is impaired by excessive fouling of the traverse mountings. For example, when waste lies on the parts which roll or glide upon one another while the carriage is in motion, then that motion becomes uneven or jerky. As a result burners on the carriage are not properly maintained on the exact indicated course. This is especially serious when the traverse mounting is set at floor level, where there is a particularly heavy accumulation of waste.

Among the objects of the present invention is the provision of a traversing carriage for a metal-burning cutting machine in which the foregoing problem is minimized or entirely avoided.

The foregoing objects are attained by mounting the carriage on liquid-sealed rail structure that causes the sealing liquid to trap any material against reaching the traverse mounting.

By way of example, the liquid-sealed rail structure can include tank means that extends along the rail structure and contains the sealing liquid, the tank means having an open top and cover structure that spans a portion of the open top, the cover structure including opposed flange portions that dip down into the liquid in the tank to seal the space between the flange portions, the traverse mounting being located in that space and being connected to the carriage body by structure that extends down into the liquid below the flanges and emerges from the tank top through the portion not covered by the tank cover.

A practical development of the invention would also have the tank cover easily removable for simpler servicing.

The traverse carriage of a metal-burning cutting machine is as a rule constructed with two parallel tracks, and the liquid-sealed construction is preferably applied to both tracks. It is helpful to have the tanks for the separate tracks on the same level and to connect them by a communicating conduit and link them to a common inflow so that it is only necessary to supervise the liquid level in one place, and the change of liquid necessary from time to time can be accomplished through the common inflow for both systems. The tanks are best anchored in the

ground, for example cemented in. It is advisable to have the two tracks adjusted to run exactly horizontal, as by providing them with elevation-adjusted elements at several spaced locations.

The invention will now be explained in more detail in conjunction with the attached drawings, wherein:

FIG. 1 is a front view, somewhat schematic, of an oxyacetylene cutting machine;

FIG. 2 is a sectional view of the maching of FIG. 1 taken along lines II—II;

FIG. 3 is a detail view similar to that of FIG. 1 with parts broken away and in section to better show its construction;

FIG. 4 is an exploded view with parts broken away, of a ball-bearing guide section of the maching of FIG. 1; and

FIG. 5 is a view similar to that of FIG. 3 showing a modified carriage mounting pursuant to the present invention.

In FIGS. 1 through 4 the number **1** refers to a beam constructed in the form of an elongated panel, and **2** refers to the entire carriage that includes the panel and is carried by two supports **3** and **4**. The two supports **3** and **4** are movably mounted with respect to horizontally extending guide rail assemblies **5** and **6**. Panel **1** also carries a rail **7** that extends perpendicularly to the guide rail assemblies **5** and **6** and movably holds four cutters **8**, **9**, **10** and **11**. When in use the cutters are directed towards a work piece such as **17** held on work bench **16**. The movement of the cutters is controlled by orthogonal coordination between travel on the guide rail assemblies **5** and **6** on the one hand, and rail **7** on the other.

A switchboard **20** may be provided for the operation of electrical and other appliances which in part are inside the panel **1**, but are not shown in the drawing. **21** designates gas inflow pipes and **22** designates supports for the gas inflow pipes and the like, which are attached to the panel.

Two parallel arranged elongated tanks **30** and **48** are provided for the respective guide rail assemblies **5** and **6**. The tanks **30** and **48** are cemented into the floor and hermetically sealed at each of their longitudinal ends. One sealed end is shown at **120** in the rear of FIG. 3. Along the length of guide rail assembly **5** is a rail **38** which stretches the whole length of tank **30** and is held in place by means of setscrews **113** and **114**. These setscrews serve to keep the rail **38** level and to this end are screwed to a plate **32** which is welded to the tank **30**, and are locked by nuts **115** and **116** respectively. Other setscrews of this type can be distributed over the entire length of the rail.

Rail **38** has an essentially double T profile and at each side of its head **39** has parallel tracks **40** and **41** respectively. Ball-bearing support segments **42** are movably fitted into these tracks **40**, **41**, and are secured to the support pedestals **3**, **4**. Only the ball-bearing segment **42** for track **41** is illustrated in FIG. 3.

FIG. 4 gives a better view of a ball-bearing segment **42** and of its mounting arrangement. Segment **42** has an inverted U-shaped shroud **46** between the arms of which is fixed a guide sheet **45** provided with a recessed endless ball track **44** for a row of even-sized ball bearings **43**. The shroud **46** is secured to the sheet **45** which is so spaced from the arms of the shroud that these arms keep the balls in place in the track **44**. The shroud is also secured to its carriage pedestal as explained below.

Guide sheet **45** projects down beyond the lower end of the shroud **46**, and is received in a groove **47** in its track **41**. The bearings of the ball-bearing segment engage tapered bearing faces on each side of groove **47** over which they roll when the carriage is moved on its track assemblies. Shroud **42** further protects the bearings from

any foreign solid particles that do manage to find their way into the bearing zone.

The ball-bearing segments **42** are fixed to the short arms of J-shaped supports **50, 52**, which in turn are fixed by their longer arms to a plate **51** at the bottom of each carriage pedestal. The supports are positioned with their shorter arms facing each other, and most of the space between their longer arms is spanned by a tank cover **54** which is secured to the rail head **39** between the bearing tracks **40, 41**. Cover **54** has downturn flanges along each longitudinal edge and these edges dip down into the liquid in each tank between the arms of each J-shaped support. Cover **54** also extends from one end of the tank **30** to the other and is hermetically sealed at each end as by a gasketed joint or by welding. The sides of the rail tanks extend up higher than the tracks **40** and **41** so that the tanks can be filled with a liquid to such an extent that the lower edges of the flanges of the cover **54** dip into the surface of the liquid, as explained above. In this way a sealed space **55** is created by the surface of the liquid, the cover **54**, the sides and the two ends of the tank **30**. The tracks **40** and **41** and the ball-bearing segments are in this sealed space and thus protected against the outside atmosphere as well as the penetration of dust.

Two or more ball-bearing segments **42** can be used in each track, if desired. The two tanks **30** and **48** can also be connected by a communicating conduit **117** which is attached to a common liquid supply and drainage conduit **118**. The most advantageous liquid to be used is one that does not affect the structures it engages and is not flammable. Water is a particularly desirable liquid, as for example when the rail assemblies are made of stainless steel.

Where the rail supports are such that the carriage **2** is securely held against tilting or twisting, it is sufficient to provide the carriage propulsion along the rails from only one side of the carriage. This can be effected as by a motor, not shown, which rotates a vertical shaft **60** journalled in support pedestal **3**. By rotating the shaft in one direction or the other, a pinion **61** on its lower end engaged with a toothed rack fixed along rail **38** will smoothly propel the carriage.

The two support pedestals **3** and **4** only extend a short distance along the rails and in every position of the carriage the greatest part of the rail tanks and their covers **54, 119**, remain exposed. These covers are accordingly easily made removable as by having them screwed in place. Service personnel can thus have ready access to the internal portions of the rail assemblies. The slits between the tank tops and their covers can be dimensioned so that they are essentially narrower than a human foot in order to minimize accidents. Turned-in lips at the tops of the tank sides are a convenient way to adjust these slits.

The liquid trap seals of the present invention can also be obtained by guide means other than the ball-bearing segments described above, although these are especially advantageous. Another type of guiding apparatus which can be used within the framework of the invention will now be described in connection with FIG. 5.

According to FIG. 5 a tank **100** carries a track **101**, the head of which, **102**, has two diagonally situated rolling surfaces **103** and **104**. A support **105** has J-shaped side projections **106** and **107** that dip into the tank. On the free ends of these projections are situated rollers **108** and **109**. A cover **110** of inverted U-shaped cross-section has its side edges hanging over the rolling surfaces and dipping

into the liquid in the tank. In this way again a sealed space **111** is created to protect the bearings against the outside atmosphere.

The sealed spaces **55** or **111** can have their upper portions connected to vents or the like that can be controlled as by shut-off valves, for the purpose of more readily permitting the tank liquid to rise above the level of the lower ends of the cover flanges. Without such vents the liquid in the tanks can be forced up to the desired level as by extending liquid-supply conduit **117** vertically upward outside of the tank to provide a hydrostatic head that develops the necessary pressure in the liquid. The level of the liquid in the head can in such an arrangement be observed to detect whether the sealed spaces remain airtight. When they begin to leak air, the level of the head will drop.

Obviously many modifications and variations of the present invention are possible in the light of the above teachings.

What is claimed:

1. A traversing carriage in combination with a metal-burning cutting machine, said machine being mounted on said carriage, said carriage being mounted for traversing on a liquid-sealed rail structure that causes the sealing liquid to trap any material against reaching the traverse mounting.

2. The combination of claim **1** in which the rail structure includes two spaced parallel liquid-sealed rails each provided with a sealing tank, both tanks being interconnected to hold sealing liquid at essentially the same level.

3. The combination of claim **1** in which the liquid-sealed rail structure is at least partially embedded in a floor.

4. A traversing carriage for a metal-burning cutting machine, said carriage being mounted on traverse mounting means for traversing on liquid-sealed rail structure that causes the sealing liquid to trap any material against reaching said traverse mounting means, said rail structure including tank means that extends along the rail structure and contains the sealing liquid, the tank means having an open top and cover structure that spans a portion of the open top, the cover structure including opposed flange portions that dip down into the liquid in the tank to seal the space between the flange portions, said traverse mounting means being located in that space and being connected to the carriage body by structure that extends down into the liquid below the flanges and emerges from the tank top through the portion not covered by the tank cover.

5. The combination of claim **4** in which the rail structure includes a rail contained within the tank means and having elevation-adjusting means at spaced locations along its length.

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U.S. Cl. X.R.

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