

UNITED STATES PATENT OFFICE

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METALWORKING MACHINE

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The invention relates to metal working machines and especially to the multi-spindle type, the principal object being to provide a machine of this class having on one or both sides a protecting or safety-device adapted to protect against splashing cuttings and chips or coolant.

A further object of the invention is to provide a metal working machine in which the protecting device is formed by a slidable protecting shield adapted to be moved by means of rollers upon rails fixed on the machine.

It has been already proposed to employ as safety-device a closed hood embracing the entire field of tooling and formed of one or two parts. For the purpose of mounting this hood, if it is made of two parts, there is provided beneath the apex of said hood a longitudinal rail extending and arranged above the metal working machine. In many cases such a rail cannot be arranged above the machine and is for the most part inconvenient and disturbing and gives an unfavorable aspect. If the said hood is made of one piece, it will become rather high and clumsy for the reason that the hood must be moved or lifted over several upper parts of the machine, as e. g. over the top slides thereof.

According to the present invention the metal working machine is characterised by the combination of a bed provided with an oil pan, a pair of upright housings carried thereby, one of said housings constructed to receive a work spindle carrier and the other constructed to receive the tool spindle carrier, a vertical protecting shield on each side of the said housings and extending to the said oil pan and means for supporting the said protecting shield on the machine.

In the drawing accompanying and forming a part of this specification an example of the invention is shown.

Fig. 1 is a side view of a metal working machine provided with the protecting device according to the present invention.

Fig. 2 is a cross sectional view of the machine according to Fig. 1.

Fig. 3 shows a part of the protecting device of Fig. 2 in an enlarged scale.

Fig. 4 illustrates in a side view a detail of Fig. 3.

The metal working machine of which only those parts are illustrated in the drawing as is essential to disclose the present improvement, comprises a pair of upright housings for the work spindle carrier 2 and the tool spindle carrier 3, the said housings being connected by the usual upper beam 4 of triangular cross-section. The housings for the work spindle carrier and the tool spindle carrier

are mounted on a bed provided with the usual oil pan 1 on each of the upper rims of which there is fixed a lower rail 7. Above the said rails 7 there are arranged upper rails 6 fixed by means of stay bolts 8 on the said housings for the work spindle carrier and the tool spindle carrier and on an auxiliary bracket 9 also fixed on the said oil pan.

On each side of this structure a large protecting shield 5 is arranged adapted to cover laterally the entire field of tooling or place where the cuttings or chips are formed, such protecting shield being slidably mounted on the rails 6 or 7 by means of rollers 10, 11 or the like.

In the preferred embodiment of the invention only one rail on each side of the machine and especially the upper rails 6 is used for supporting the said protecting shield. For this purpose rollers 10 fixed on the protecting shields are adapted to run upon the said rails 6 which are arranged approximately in the height of the horizontal median line of the said shield. The other or lower rails 7 arranged approximately in the height of the lower edges of the shields and on which the counter rollers 11 fixed on the protecting shield run have the purpose to prevent a tilting and/or a lifting movement of the said protecting shield. Preferably the counter roller or counter rollers 11 are adjustably mounted on the protecting shield in order to be able to adjust the said rollers 11 with respect to the supporting rollers 10. As shown in Figures 3 and 4 of the drawing the roller axle 12 of the counter roller 11 is fixed on a plate 13 which may be secured on the protecting shield by means of screw bolts 14 passing through elongated slots 15 of the plate 13, so that the plate 13 with the counter roller 11 may be adjusted in a vertical direction.

As shown in the drawing oil discharging sheets 16 are fixed on the inside of each protecting shield and each of the said oil discharging sheets is provided with an oil channel 17 at one end. By means of the said oil discharging sheets the oil or other cooling fluid spread upon the protecting shield is delivered into the oil channel and thereupon into the oil pan 1. Owing to the arrangement of the described oil channels 17 it is possible to move the protecting shield beyond the oil pan 1 to the left into the position shown by the dots and dashes in Fig. 1 without the danger that any oil may drop upon the floor. Also in this position of the protecting shield the oil is delivered by means of the oil channel 17 into the oil pan.

It is to be understood that the invention is not limited to the details of construction and arrangement of parts illustrated in the accompany-

ing drawing, as the invention is capable of other embodiments, as e. g. the supporting rollers may run upon the lower rails while one or two counter rollers mounted on the protecting shield may co-

operate with the upper rail or rails. If it is desired, the supporting rollers and counter rollers may be mounted on the metal working machine and the supporting and guiding rails may be fixed on the protecting shield.

10 What we claim is:

1. In a metal working machine, the combination of a bed provided with an oil pan, a work spindle carrier housing and a tool spindle carrier housing, a sliding upright protecting guard shield

15 at one or both sides of the machine and extending upwardly from the oil pan, and means located substantially at the horizontal median line of the shield for supporting it on the machine for endwise displacement.

20 2. The structure of claim 1 in which means is located below said supporting means for preventing tilting of the shield.

3. The structure of claim 1 in which means is located below said supporting means for guiding

25 and preventing both tilting and lifting of said shield and comprises a rail and rolls.

4. The structure of claim 1 in which the supporting means comprises a rail and rolls, a part thereof carried by the housing and a part by the

30 shield, and means also comprising a rail and rolls located below said supporting means and carried by the shield and oil pan for preventing tilting of the shield.

5. The structure of claim 1 in which means is

35 located below said supporting means and carried

by the shield and oil pan for preventing tilting of the shield, said shield having means for pocketing and conducting into the oil pan the oil splashed upon the shield.

6. The structure of claim 1 in which said supporting means comprises a rail and rolls, a part carried by the shield and a part carried by the housing, and adjustable means located at the lower edge of the shield for guiding and preventing both tilting and lifting thereof and likewise

10 comprising a rail and rolls, a part carried by the oil pan and a part by the shield.

7. The structure of claim 1 in which said supporting means comprises a rail and rolls, a part carried by the shield and a part carried by the

15 housings, and means located at the lower edge of the shield for guiding and preventing both tilting and lifting thereof and likewise comprising a rail and rolls, a part carried by the oil pan and a part by the shield, said shield provided with

20 pocketed oil delivery means at its inner side.

8. In a metal working machine, the combination of a bed provided with an oil pan, a work spindle carrier housing and a tool spindle carrier housing, a sliding upright protecting guard shield

25 located at one or both sides of the machine and extending upwardly from the oil pan, and means for supporting said protecting shield to allow endwise displacement thereof and comprising two sets of parallelly located supporting means, one

30 located substantially at the horizontal median line of said shield.

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