Aug. 22, 1933. W. E. FLANDERS 1,923,781

WASTE CONVEYER

Original Filed March 19, 1930

Fig. 1.

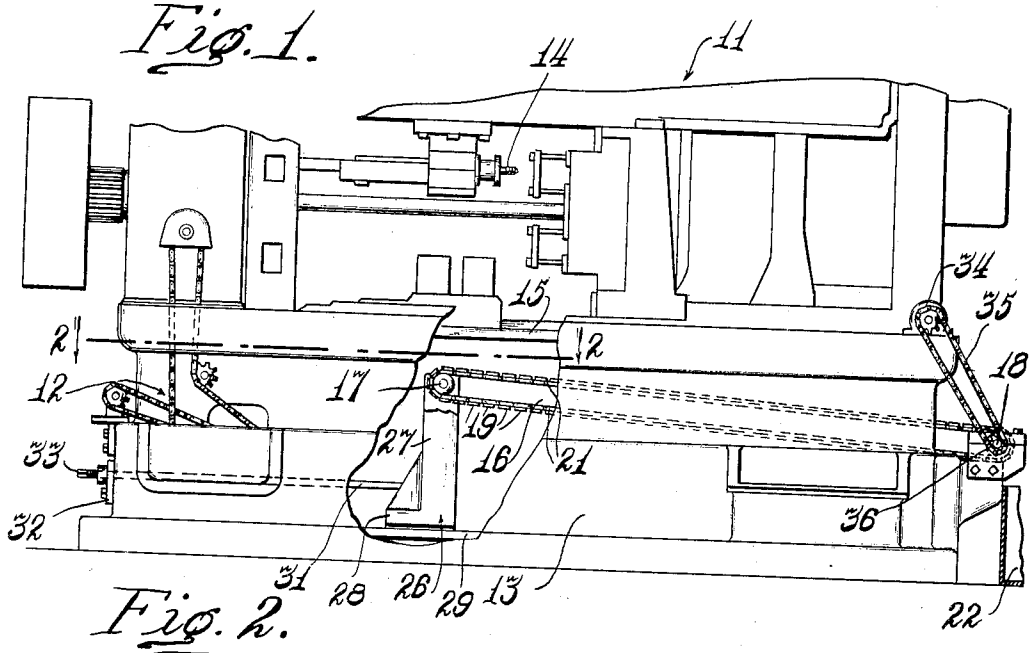


Fig. 2.

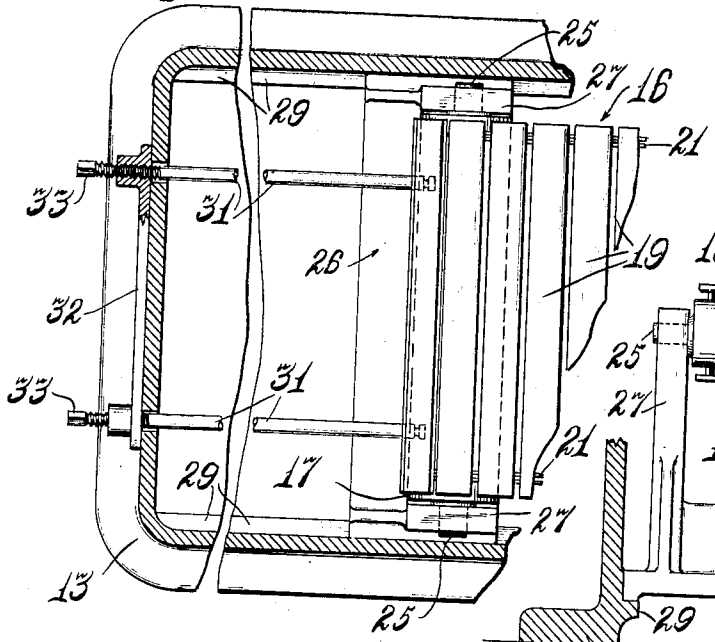


Fig. 3.

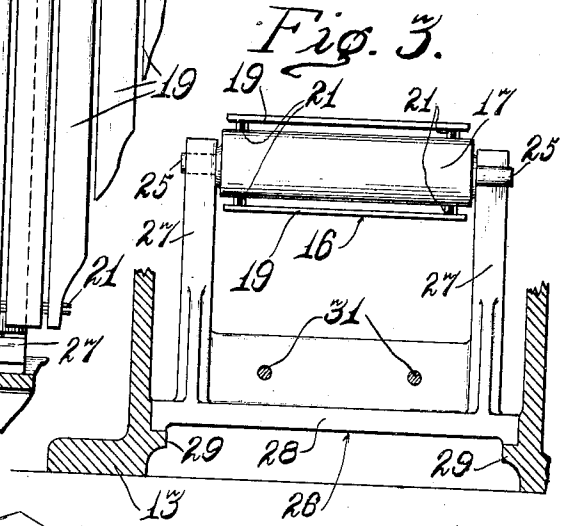
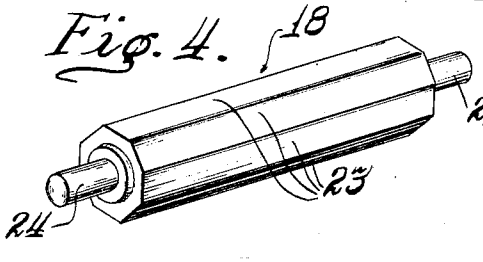


Fig. 4.



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WASTE CONVEYER

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4 Claims. (Cl. 29—1)

The invention relates to improvements in waste conveyers and particularly to an improved conveyer structure adapted for separating metal cuttings or chips from the lubricating oil and delivering said cuttings outwardly beyond the frame of the machine.

An object of the invention is to provide a machine with novel means for maintaining the lubricating oil free of metal chips to insure uninterrupted operation of the oil pump therein.

Another object is to provide an improved device for separating metal chips from the lubricating oil in a cutting machine to insure delivery of oil to the cutting tool.

Another object is to provide automatic means for conveying metal chips outwardly of a machine thereby reducing the amount of labor required to operate the machine.

The foregoing and such other objects of the invention as will appear hereinafter as the description proceeds will be more readily understood from a perusal of the following specification, reference being had to the accompanying drawing, in which:

Fig. 1 is a fragmentary side elevational view of an automatic screw machine illustrating the application of the improved waste conveyer, showing parts broken away.

Fig. 2 is a fragmentary horizontal sectional view of the machine frame, taken substantially on line 2—2 of Fig. 1.

Fig. 3 is a fragmentary vertical sectional view of the machine frame, showing the adjustable conveyer bearing in elevation.

Fig. 4 is a perspective view of one of the conveyer rollers.

Metal cutting machines of the known type lack positive means for separating and removing the waste material, such as metal cuttings and chips, from the lubricating oil contained in the frame of the machine. The lighter of these chips mix with the lubricating oil and clog the oil circulation pump commonly provided to deliver oil to the cutting tool. Machines of the character generally referred to heretofore, necessitated the use of crude and inefficient methods for separating and removing the metal chips or other waste from the oil to prevent clogging of the oil pump, which when clogged results in insufficient lubrication and subsequent injury to the machine. Removal of waste chips manually from the base frame of the machine, requires the combined efforts of an operator and a helper to maintain and operate three machines. The improved automatic means for removing the waste enables one operator to attend three machines without danger of any of said machines becoming inoperative because of clogged oil lines.

Referring to the drawing in which an exemplary form of an automatic screw machine is shown, by way of example, the machine 11 has the usual oil pump mechanism 12 arranged adjacent one end of the frame or base 13 for recirculating oil to lubricate the cutting tool 14. When the machine is in operation, oil drippings and metal chips drop through an opening 15 in the top of the frame 13 and into an oil reservoir or sump (not shown) therein. The metal chips must be separated from the oil and removed from the machine before the oil is recirculated by the pump mechanism 12.

As shown in Fig. 1, an endless conveyer 16 extends into the frame 13, preferably from one end, for separating the oil and removing the chips or other waste. The conveyer 16 preferably extends longitudinally of the machine and is mounted upon suitable transverse shafts or rollers 17 and 18. The conveyer 16 necessarily is of such structure as to allow the oil to drip therefrom into the reservoir disposed below it. To this end, it is preferable to provide a conveyer with spaced transverse members or slats 19 secured, adjacent their ends, to suitable endless link chains 21. The waste falling onto the conveyer is carried outwardly beyond the frame and is deposited in a suitable receptacle 22 arranged at one end of the machine. During the travel of the conveyer outwardly of the machine, the oil drips through the space between the slats and into the reservoir.

It is preferable that the driven roller 18 be formed with flat faces 23. Trunnions 24 extend outwardly one from each end of the roller 18 and are journaled in suitable bearing brackets 24 rigidly secured to and extending beyond the respective side walls of the base frame 13. The roller 17 has ends 24 of reduced diameter removably journaled in an adjustable bearing bracket 26. This bracket preferably is formed substantially U-shaped providing vertical upwardly extending bearing supports 27 one adjacent each end. The base 28 of the bracket 26 is mounted for sliding along suitable flanges or guides 29, preferably formed integral with and extending inwardly from the longitudinal side walls of the base frame 13.

The tension of the endless conveyer 16 is adjusted by sliding the bearing bracket 26. To effect this adjustment a pair of spaced rods 31 are operatively connected to the web between the

supports 27 and extend rearwardly of bracket 26 through a suitable bearing plate 32 mounted on one end of the frame 13. The bearing plate 32 has spaced internally threaded bosses to receive the threaded end of the respective rod 31, and a squared end 33 preferably is formed on each rod to facilitate manipulation thereof.

The waste conveyer 16 preferably is driven independently of the machine by a suitable motor 34. A chain 35 operatively connects said motor with a sprocket 36 carried on the end of one of the trunnions 24 of the driven roller 18. It readily can be understood that automatic means, such as described in the foregoing, for separating metal cuttings and other waste material from the lubricating oil and conveying said waste outwardly of the machine, can readily be incorporated into the structure of any similar type of machine wherein it is imperative that the lubricating oil be kept free of any and all foreign matter.

Although a substantially smooth conveyer surface is provided by the spaced slats 19, any other suitable form of conveyer, capable of retaining the waste material, may be employed, however, suitable means must be provided in any such conveyer to allow for the free passage of oil therethrough.

I claim:

1. In a machine having means therein to convey metal cuttings beyond the machine frame, said means comprising, in combination, a conveyer consisting of spaced slats arranged laterally over endless chains, rollers for supporting said conveyor, one arranged outside said frame and the other mounted in an adjustable U-shaped bearing bracket within said frame, guides integral with said frame supporting said bracket, and adjusting screws extending from said bracket outwardly of said frame to facilitate adjustment of said bracket to vary the tension on said conveyer.

2. In a machine having means therein to convey metal cuttings beyond the machine frame, said means comprising, in combination, a conveyer consisting of spaced slats extending laterally over a plurality of endless chains, two rollers for supporting said conveyor, one arranged outside said frame whereby cuttings deposited on said conveyer are carried beyond said frame, the other roller being journaled in a bracket mounted upon longitudinal guides within said frame, said bracket being adjustable to vary the tension on said conveyer by manipulation of screws extending therefrom to the outside of said frame.

3. In a machine, means to convey and discharge cuttings beyond one end of the machine frame, comprising, in combination, a roller mounted on the outside of said frame at one end, a bracket having vertical uprights mounted on guides within said frame, a roller journaled in the upper ends of said uprights, a web connecting said uprights below said roller, endless chains trained over said rollers having spaced slats extending laterally thereacross to provide a conveyer having openings therein, and means associated with said web to adjust said bracket longitudinally of the conveyer to vary its tension, said means consisting of two adjusting screws extending outwardly of and threadingly engaging a bearing bracket on the other end of said frame.

4. A waste conveyer adapted for use in association with a cutting machine comprising, in combination, spaced rollers adapted to be mounted in said machine, an endless conveyer mounted on said rollers, means driving one of said rollers, said roller being polygonal in cross-section for frictionally driving said conveyer and being mounted in a bearing extending beyond one end of said machine, the other roller being journaled in a U-shaped bearing bracket slidingly mounted within the frame of said machine, and means to adjust said bracket consisting of twin screws operatively connected therewith, said screws extending outwardly of the frame of said machine.

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