

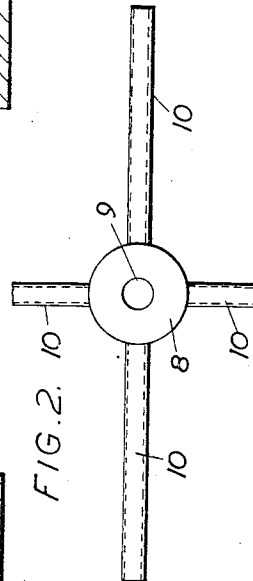
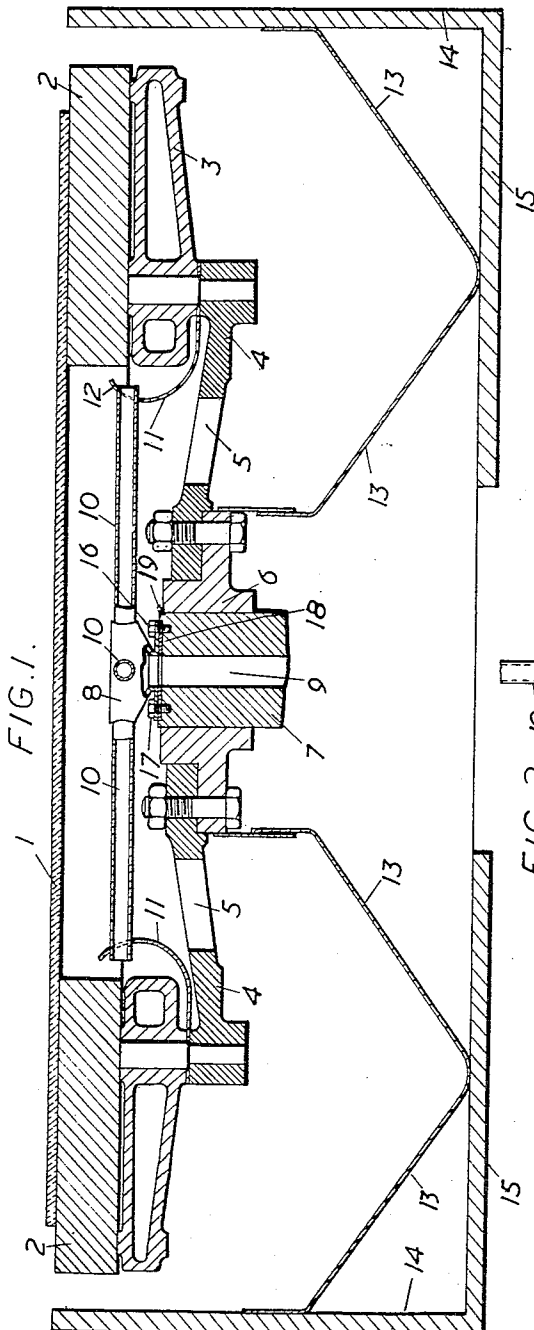
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APPARATUS FOR GRINDING THE BOTTOM SURFACE OF A RIBBON OF GLASS

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## APPARATUS FOR GRINDING THE BOTTOM SURFACE OF A RIBBON OF GLASS

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4 Claims. (Cl. 51—209)

The present invention relates to apparatus for simultaneously grinding both surfaces of a ribbon of glass.

A well known form of apparatus for simultaneously grinding the two surfaces of a ribbon of glass comprises coaxial tools each including circular grinding discs mounted to rotate around vertical axes and arranged in coaxial pairs one towards each face of the ribbon, the pairs being arranged longitudinally along the path of movement of the ribbon and the ribbon of glass being continually advanced between pairs of opposed discs which engage and grind the two surfaces of the ribbon. Such a construction is disclosed in patent specification No. 1,729,498.

The present invention concerns the lower tools, i. e. those including grinding discs operating against the lower surface of the ribbon of glass.

As is well known the grinding surface of these grinder discs comprises an annulus of nogs separated like islands by intersecting channels, the annulus surrounding a central cavity of the tool which cavity is somewhat in the form of a basin. A liquid suspension of abrasive is fed to this basin through the coaxial hollow shaft which drives the disc. From the basin the abrasive suspension passes into the channels which separate the nogs opening into the central cavity, and due to the hydrostatic head and centrifugal forces developed swirls up into the channels and finally engages between the faces of the nogs and the ribbon of glass.

It has been found that with these known forms of tools, an accumulation of fragments of glass (cullet) is produced in the basin constituted by the central cavity in consequence of accidental breakages of the ribbon which accumulation more or less obstructs the opening at the top of the hollow driving shaft through which the abrasive liquid is fed. The result is an irregularity in the feed of abrasive which is prejudicial to the quality of the grinding, and may cause stoppage of work for the removal of the fragments of glass.

The main object of the present invention is to devise a means of feeding the abrasive fluid to the lower grinding discs in apparatus of the kind referred to and to devise means of preventing cullet accumulation in the central cavity of the disc whereby the aforesaid disadvantages are avoided and furthermore to create other advantages which will appear from the following description.

The present invention consists in conducting the suspension of abrasive from the hollow driving shaft of a bottom grinding disc through conduits into the inner end channels in the disc which separate the nogs, in contradistinction to present practice in which the suspension is supplied to the channels from the central cavity itself, the wall of the central cavity being formed with apertures through which cullet may escape during operation of the machine.

It may be advantageous to cause the conduits which thus feed the suspension of abrasive to the channels to open into a trough formed near the wall of the central

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cavity, the trough being formed to direct the suspension received from the conduits towards the channels opening into the central cavity.

The risks of obstruction by cullet previously referred to are eliminated by means of the present invention. In this way, to a great extent, one can avoid small fragments of glass being taken by the abrasive liquid into the channels between the nogs blocks. It is known that in the usual tools these fragments escape when the ends of the channels overlap the ribbon of glass but are then knocked by the nog against the edges of the sheet which they splinter, creating the starting points for breakage.

Furthermore, the apertures formed in the wall of the central cavity in accordance with the present invention provide the further advantage of putting the latter into communication with the atmosphere and of thus eliminating the creation of a vacuum which would tend to be created under the ribbon of glass with the usual tools with an airtight central cavity, at the moment of starting up, which vacuum is represented by a suction likely to cause such a deflection of the glass into the cavity as to lead to breakage of the ribbon of glass.

In order that the invention may be more clearly understood a preferred embodiment thereof will now be described by way of example with reference to the accompanying diagrammatic drawings in which:

Fig. 1 is a vertical central section of a lower tool of a coaxial pair intended to operate simultaneously on a ribbon of glass advanced between them. The upper tool is not shown as it forms no part of the present invention, and

Fig. 2 is a fragmentary plan showing the conduits for the liquid abrasive, leading from the hollow driving shaft of the disc to a trough, and from the trough into the inner ends of the channels in the grinder surface.

In the drawings the ribbon of glass 1 to be ground is shown resting on the lower tool which comprises a grinder disc 2 and a backing plate 3 assembled in known manner at the periphery of a plate 4, which forms the floor of the central cavity of the disc, the plate, in accordance with the invention, comprising openings 5 distributed regularly about the axis of the tool to permit evacuation of used abrasive liquid and fragments of glass. The plate 4 is fixed in usual manner by bolts on to a collar 6 which is firmly fastened to a coaxial hollow driving shaft 7 which imparts the desired rotary movement of the tool.

A junction box 8 is superimposed on the driving shaft 7 and is connected in a water-tight manner on the driving shaft 7 to connect the interior of the box with the bore 9 of the driving shaft, as an extension thereof, by which bore the liquid abrasive is fed directly into the box 8. From the box 8 emanate a group of radial tubes 10 through which the abrasive liquid reaching the box 8 is thrown towards the grinder disc by centrifugal force. The liquid pours from the tubes 10 into a circular trough 11 adjacent the wall of the central cavity, whence it moves on into the inner ends of the channels separating the nogs and which merge into the central cavity.

The trough 11 is formed from sheet metal, the lower part of which is, for example, clamped in a water-tight manner between plate 4 and backing plate 3 and the upper part of the trough is shaped so that its edge 12 is in proximity with the internal wall of the disc at about the height of the base of the channels. The form of the troughs is such that very little if any fragments of glass can get into them.

The invention also comprises the provision of an annular collecting tank 13 located under the tool. The tank may be secured to the usual framework 14 at the sides of the apparatus and on the floor 15 of the factory, the tank being disposed to receive any fragments of glass

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and liquid escaping through the apertures 5 of the plate, as it does in practice.

By the present invention accumulation of cullet producing defective feed of abrasive is entirely prevented and in consequence stoppages to clear accumulation are entirely avoided whilst fragments of glass falling into the central cavity are prevented from being delivered into the central cavity.

Variation in the construction disclosed will be apparent to those skilled in the art, for example the trough 11 may be constituted by a wall emanating from the backing plate 4 as an integral part thereof and its form modified without departing from the invention defined in the appended claims.

Conveniently the box 8 is formed from sheet metal and includes a base flange 16 which is secured by studs as indicated at 17 through a washer 18 on to the top end 19 of the driving shaft 7, the top end 19 being countersunk to receive the washer 18.

I claim:

1. A lower grinding disc for use in an apparatus for simultaneously grinding both surfaces of a ribbon of glass as it is advanced in a horizontal plane from the Lehr, comprising an annular grinding surface defining a central cavity member including a floor fixed to a hollow driving shaft for the disc, said grinding surface being intersected by distributing channels extending from the central cavity outwardly of the disc, by which channels abrasive fluid fed through the bore of the hollow driving shaft reaches the grinding surface of the disc, and a group of conduits connected to the bore of the hollow driving shaft and leading to the inner ends of the distributing channels in the grinding surface of the disc so that the whole of the abrasive fluid fed through the bore of the hollow driving shaft is delivered through the conduits to the said channels, the floor of the central cavity member of the disc being apertured to permit discharge of cullet and spilt fluid.

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2. A lower grinding disc for use in an apparatus for simultaneously grinding both surfaces of a ribbon of glass as it is advanced in a horizontal plane from the Lehr, comprising an annular grinding surface defining a central cavity member including a floor fixed to a hollow driving shaft for the disc, said grinding surface being intersected by distributing channels extending from the central cavity outwardly of the disc, by which channels abrasive fluid fed through the bore of the hollow driving shaft reaches the grinding surface of the disc, a trough at the periphery of the central cavity member and a group of conduits connected to the bore of the hollow driving shaft and opening into the trough, whereby the whole of the abrasive fluid fed through the bore of the hollow driving shaft is delivered to the trough, the trough being shaped so as to direct the abrasive fluid, thus received, into the inner ends of the distributing channels in the grinding surface of the disc, and the floor of the central cavity member of the disc being apertured to permit discharge of cullet and spilt fluid.

3. A lower grinding disc according to claim 2 comprising a box mounted coaxially on the hollow driving shaft, the group of conduits emanating from the box and the interior of the box communicating with the bore of the driving shaft as an extension thereof.

4. A lower grinding disc according to claim 2 comprising an annular trough disposed under the disc to collect cullet and fluid issuing from the central cavity member of the disc,

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