Until now manual carousel heating machines have been used for heating the edges of blown wares both in Russian industry and abroad.

At the "Neman" plant these machines were in operation until 1960. Three men attended to each machine—one took the wares from the grinding conveyer and placed them on the heating machine, another turned the machine by hand, regulating the burner flame and prepared the device for the heat treatment, the third removed the hot wares from the machine and placed them on the delivery conveyer. The working conditions were difficult.

In 1960 the chief mechanic I. S. Zuev and shift manager Yu. N. Gukov designed a mechanical unit for heating glasswares which automatically picked up the goods from the grinding conveyer, heated them and placed them on the delivery conveyer without the need for manual labor. One worker only is needed to attend the machine and his work is greatly lightened.

The mechanical equipment consists of the following basic parts: a carousel heating machine, loading and unloading disc transfer devices, a chain conveyer for grinding and a removal (delivery) conveyer.

The unit is driven from a common drive which consists of an electric motor 0.6 kw capacity, a reducer RM-250 with i = 48.57 and a cogged drive with i = 1.9. The transfer devices are connected with the drive through a pinion drive (z = 8) and a pinion transfer device (z = 40).

From the chain conveyer 1 (Fig. 1) the ware advances to the loading disc 2 with the aid of pincer clamps located under the action of the eccentric mechanism. The loading device places the ware on the carousel heating machine.

The clamps (Fig. 2) have grooves along which the pin or finger 1 of the pincer pusher moves. On the pusher 2 at the bottom is placed a slide block 3, moving in the groove of the pusher. At the end of the slide block is fitted a shaft 4 which moves over the internal surface of the eccentric mechanism, permanently fitted to the transfer shaft over the disc clamps.

Moving over the internal surface of the hollow of the eccentric, directed toward the center, the shaft 4 draws the slide block to the center. The block in turn, through a spring 5 fitted at one end to the finger of the shaft 4 and at the other to the stopper 6 of the pusher, draws the pusher 2 with the finger 1, compressing the clamp owing to the force of the spring. The clamps are pressed with the help of the spring 7 connected to the pincer clamp and the pusher 2.

Thus the pincers of the loading device are pressed together and pulled apart by the force of the spring in contrast to the eccentric on the unloading device where the pincers are opened by rigid compression of the lug (projecting component) of the eccentric directly on the shaft fitted to the pusher of the pincers without a slide block,
The difference between the working of the pincers is due to the fact that on the unloading device the pincers can be opened gradually, drawing near to the ware on the heater, and consequently the roller of the pusher will be raised smoothly up the inclined lug of the eccentric. The pincers should be closed quite quickly since with differences in the diameters of the stems of wine glasses and tea glasses, the ware will move away from the center of the jaws of the pincers. But in the loading device, on the other hand, the pincers should take the ware from the conveyer smoothly and should be opened quickly at the moment they are placed on the chuck.

The jaws of the pincers on the clamps look like three movable fingers, which make them suitable for a wide range of ware—from wine glasses with thin stems to tea glasses.

The heads of the pincers are bent from 2-mm sheet steel. The space between the sheets in the jaws is filled with plywood to avoid cracking of the ware when it comes into contact with the metal. The pincer clamps are fitted to transfer devices by the projecting ends of the finger 8 in the upper and lower flanges of the device.

After passing through the heating machine the ware advances to the unloading device 3 (see Fig. 1) which is designed in almost the same way as the loader. The pincer clamps of the device 3 do not have a slide block and the operations, identical to those of the clamps on the loading device, are carried out with the pusher 2 (see Fig. 2) and the roller 4.

The pincers with the ware, approaching the heater conveyer, are raised in groups of four by the hoist 4 (see Fig. 1) and transferred through the side of the conveyer and past the returning pusher onto the conveyer.

The hoist 4 is a triangular plate designed for four pincer clamps, one end of which is fixed near the center of the disc with a hinge, and two others fitted to stoppers passing through the disc of the device and connected together by the body of the hoist pusher.

Approaching the belt of the transporter, the roller of the hoist pusher rolls on the hoist plate and, through the stopper, raises the whole group with the pincers. The roller rolls from the hoist plate over the transporter belt and the four pincers release the ware onto the belt.

At this moment the group pusher 5 pushes the fingers of the clamps and these free the finished ware, after which the ware pusher immediately pushes four articles forward on the conveyer from the opened clamps, freeing the way for the next four.

The pusher 5 consists of a 4-mm plate with grooves for moving the disc of the transfer device and the shaft which rolls over the lower eccentric of the unloading device.

It should be mentioned that the periphery of the heating machine is fitted with bands protecting the stems of the ware from heat as a result of which the cullet produced in this operation is substantially reduced. Near the ware located under the burner flame, only the upper edge projects beyond the protective bands (by 10-15 mm) and the rest is covered by the bands.

As the rotating chucks on the heating machine approach the device they are raised, carrying the ware together with the rising segment, and the products are completely removed from the seating into the bands. The chucks are driven by an electric motor with N = 0.6 kw through a work gear drive (i = 40, n = 1000 rpm).

The ware advancing along the chain conveyer from the edge-grinding machines are normally wet and some of them crack under the fire. To avoid this, over the clamps of the loading device a chamber is installed with a compressed air pipe which blows the water from the ware passing through it.