

View of Vucassovich automatic scaler showing feed end and the elevator (left) which conveys the fish to the scaler.

Scaler Boosts Fish Production

With it, Gorton-Pew turns out more fillets with fewer workers. A simple machine, it pulls out scales as fish are tumbled through it

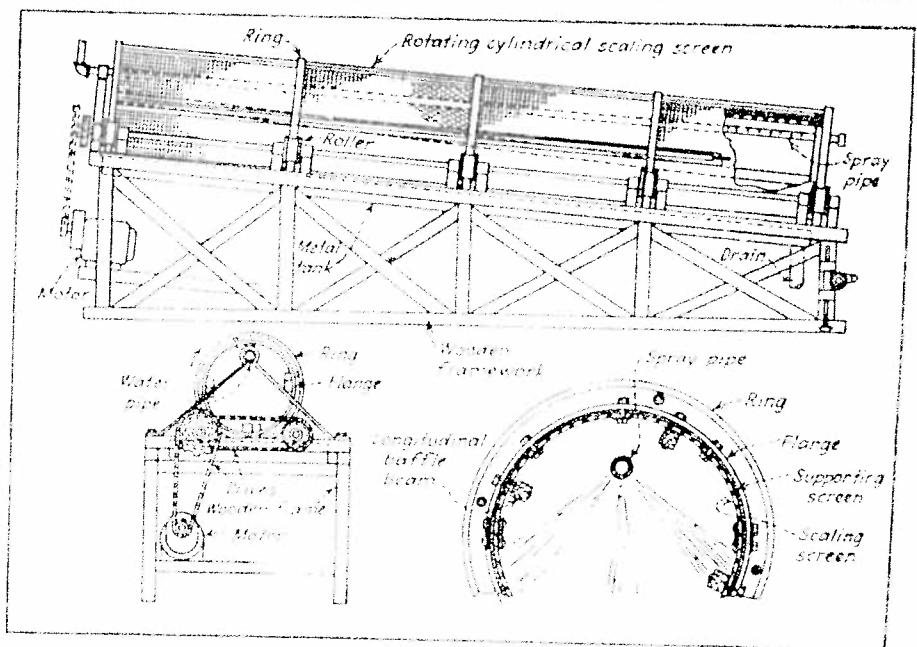
By L. V. BURTON,
Editor of "Food Industries."

AN important contribution to the nation's food supply is found in the automatic fish scaling machine invented by Michel P. Vucassovich, food technologist of Gorton-Pew Fisheries Co., Ltd., which was granted a U. S. patent, No. 2,331,855, on October 12, 1943. This invention has made possible the production of larger quantities of commercial fish fillets by the reduced force of employees that wartime conditions have imposed on Gorton-Pew, as they have on other employers in the food processing industry. The machine apparently is simplicity itself. A conveyor carries the fish from the fishing vessel to an inclined revolving cylinder from which they emerge at the lower end minus all scales. To a casual visitor, the Vucassovich scaling machine looks very much like a rotary washer used for tomato, pea, or lima bean washing in canneries or like the rotary washers used for cleaning root crops in vegetable dehydrating plants. But none of these machines would do what the scaling machine will do because of its internal construction. In fact, it is one of those machines the function of which it would be difficult

to discover from its appearance. Yet fish can be scaled by it at the rate of 15,000 lb. per hour, whereas the best previously known method of electric scaling would require about 25 active men to keep up this pace.

To appreciate what the device can

do to augment production, it should be compared to the procedure followed prior to its invention. Where hand operations were used, there was a crew of three men, one operating the electric hand scaling machine at a rate that would supply scaled fish to two filleters.



Drawings of Vucassovich automatic fish scaling machine. At top is side view showing how revolving unit is mounted. Below at left is end view showing drive and mounting; drawing at right gives details of construction.

This crew could handle about 600 lb. of fish per hour. Thus, the cost of the scaler man is eliminated and he can be put at filleting, which pays a slightly higher wage rate and is a much more attractive and less hazardous job.

The actual saving of 33 1/4 percent on man-hours in this day of labor scarcity, with deductions for the cost of mechanical scaling, actually figures out to be a cash saving of \$0.50 per 100 lb. of fillets produced. Better yet, labor is pleased at the elimination of a messy job, for where hand scaling is employed the scales fly in all directions, as any one knows who has ever cleaned a fish.

Another way of looking at it is that over 100 men in Gloucester alone are saved for other jobs. Were it not for this scaler, the Gloucester redfish production would be lower and the balance left for civilians would be considerably less. The Army is taking a high proportion of the Gloucester production.

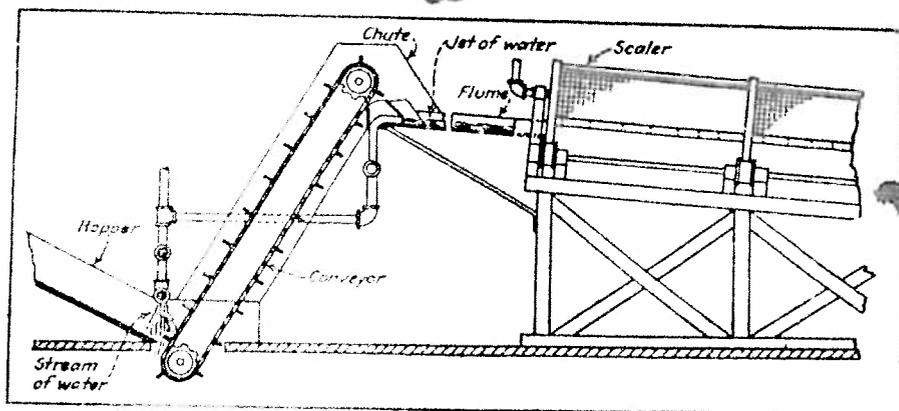
How It Works

All previous methods of scaling involve a principle much like that of removing old shingles from a roof, except for a few fish that, like herring, can be easily scaled in a revolving cylinder lined with bristle brushes. The Vucassovich method, in contrast, depends on pulling the scales out by the sharp edges of the special liner of the cylinder. Instead of being turned up upon their point of fastening, they are pulled out directly.

The idea for the machine arose from two problems created by wartime scarcity—a shortage of steel rasps for shaping cork insulation for a refrigerated storage room which was under construction in a Canadian plant owned by Gorton-Pew and the excessive cost of Chinese bristles used in a brush-lined cylinder for scaling whiting, one of the easy-to-scale fish. Expanded metal lath on a block of wood proved to be an excellent substitute for a rasp with which to shape the cork blocks, and here the inventor got his original idea that, if it would scrape off cork it would also remove fish scales. But it was not until the prohibitively high cost of bristles forced him to seek a substitute in the expanded metal lath that the original idea was ever given a trial. It worked. First tried on an easy job like whiting, it was next tried on the most difficult of all—the redfish or rosefish—where it also worked.

Certain added gadgets were also needed to make the slippery fish turn over and over, so interior baffles affixed longitudinally to the interior of the cylinder were added.

The machine, however, rusted out in a week, for the metal lath is the easily corroded carbon steel. The next



The elevating mechanism which feeds fish to the automatic scaler is diagrammed here.

problem was to get expanded metal lath made from stainless steel. Furthermore, it had to be cut at a time when the stamping dies were dull to obtain rough rather than smooth edges. These rough edges are necessary to pull the fish scales out.



Fish filleting line in Gorton-Pew plant. Before the automatic scaler was developed, it took one man with an electric scaler to keep two filleters busy.



Closeup of elevator conveying fish to the feed end of the scaler. Water sprays on the fish at the lower end of the elevator.

The weight of a mass of fish in the revolving cylinder presses the fish scales against the sharp edges with sufficient force to pull out the scales when the mass of fish is tumbled about. With a cylinder long enough to insure that all the scales of each fish were brought into contact with the sharp edges of the expanded lath, and with a spray of water inside to wash away the scales, the mass of fish comes out of the scaling machine in perfect condition in a steady stream which goes to the filleters. The flesh of the fish is not seriously abraded.

The machine works best when heavily loaded with fish, because the weight of the load forces the scales against the sharp edges. Also, the machine works better on fish that are difficult to scale by hand than it does on the easy ones. So far it has been used with perfect success on large, medium and small fish of the following varieties: pollock, haddock, rosefish, whiting, flounder and hake. Why not cod? Well, the cod has few scales of importance to be removed. Machines already are in use in several of the fishing ports on the Atlantic Coast; perhaps a use for them will be found in the west.

To exploit this invention the Gloucester Research Corp., a subsidiary of Gorton-Pew Fisheries Co., Ltd., has been formed. The plan is to license others to use the machine at a royalty based on the quantity scaled.

Although all the scaling machines used by Gorton-Pew have carried large signs to inform all persons by the legend "Patent Applied For" of the legal status of any who copied the idea, the Vucassovich scaler has been widely copied. Now that U.S. Letters Patent has been granted, an interesting legal situation arises with respect to all users of copies who, as of the date of issuance of the patent, become infringers. The company hopes to avoid any unpleasant situations by employment of a wise and generous policy of licensing on a modest royalty basis.

Applications for patents have been made in foreign countries.