

# Stinson Canning Company

## *Step-by-Step Look at New System*

In Prospect Harbor the 60-year-old family-owned Stinson Canning Co., largest fish canner in Maine, has taken a step into the future by installing all new automated equipment for sorting, cutting, and processing sardines. The equipment is of Scandinavian design and manufacture and is the only one of its kind in America and is said to be even more advanced than similar equipment in Europe.

Gone is the familiar old production line facility with its fish-loaded conveyor belt passing down a dual line of metal work tables where nimble-fingered operators cut the fish and packed them in the familiar flat cans.

During the past six months, the old system has been removed and the new equipment installed under the direction of three representatives of the companies that designed and built the equipment. These men, two from Norway and one from Sweden, are engineers long associated with the sardine business in those countries, and are the ones basically responsible for the original design and manufacture of the equipment. For several months, they have been in residence in the plant and have been busy supervising the installation, getting it operating and ready for production.

Recently, the first trial run of the new automated equipment, complete with a minimal number of non-automated women packers, was started up for the first time and we were privileged to follow the operations and to take photographs.

The fish, Atlantic herring—also called sardines—and measuring up to eight inches in length, arrive at the plant three different ways from many different places. They come by company-owned boats. Stinson has a fleet of eight, four sardine carriers and four purse seiners, and they fish from Massachusetts to the Canadian border. They come by company-owned tank trucks. Stinson has four tractor trailer trucks plus 16 insulated tankers. They arrive at the plant in big plastic tote boxes measuring about four feet square and

three feet high, holding about 900 pounds of fish. The tank trucks and tote boxes, (designed for easy stacking on a flat bed truck and easily individually moved by forklift truck) may have fish from as far away as Canada and even from overseas. In all three methods of shipment, the fresh-caught fish are immersed in a 20 percent cold salt brine, sometimes frozen, to maintain freshness.

The fish in the sardine carriers and the tank trucks are emptied by a vacuum which sucks up the fish in a large pipe and empties them into two large steel holding tanks in the plant floor, one tank slightly larger than the other. These holding tanks are partitioned off into 11 compartments, six in one, five in the other. These 11 compartments in the holding tanks act as sort of a reservoir from which the fish are drawn off as needed—and each compartment holds seven hogshead of fish.

Hogshead is an old-fashioned measure of volume still in use today as a standard of measurement in the sardine industry. It is equivalent to 17 and one-half bushels or 1,225 pounds of fish.

Each compartment of the holding tank is individually connected by a 10-inch fiber pipe to the bin at the base of the grader/sorter.

The typical load of fish that we followed had arrived at the plant in the plastic tote boxes and were dumped directly into the bin at the base of the grader/sorter as there was no need for them to go through the holding tank.

The grader/sorters, there are two of them side by side, and mounted as high up off the floor as possible in order to utilize gravity flow for the rest of the operations, are a unique V-shaped mechanism about 10 feet long. The fish are lifted from the bin by conveyor and pass along the V-shaped mechanism, revolving rollers on one, a moving belt on the other. The smaller fish drop through the narrow part of the V first and the larger fish gradually through the wider part. As they drop through, they are caught by other plastic pipes and are on their way to the various cutting machines depending on size. They flow through the pipe aided by gravity and water pressure.

For this initial run, they were sorting fish into four different sizes although the sorters are capable of more sizes.

Six cutting machines have been installed, two are for cutting steaks, the other four for sardines. They are made by Trio Maskinindustri, A/S, Stavanger, Norway and are capable of cutting from 300 to 600 fish per minute depending on the size of the fish.

It is these new mechanical cutting machines that will replace the scissor-wielding operators of the past. Each machine, manned by one operator has its own built-in traveling conveyor that carries the fish upward to a vibrating table where the fish are lined up for the cutters. The day that we watched, they were cutting steaks that would be packed seven or eight bite-sized chunks cut from the center of the fish, so the cutters here were eight fast revolving sharp blades, eight inches in diameter, that cut the fish into seven steaks and also removed the head and tail. These parts are collected by a separate pipe and are available to the local lobstermen for use as bait.

The cut steaks from each cutting machine are accumulated into two 10-foot long rotating circular brine tanks, four feet in diameter, for about eight minutes before they are conveyed to the packers. This brine is a special solution of vinegar and salt that adds flavor to the product and is said to strengthen the skin so as not to damage it later when the can is opened.

By conveyor, the cut fish now pass to an adjoining room to the automated equipment where the fish are packed by hand. One of the Norwegian engineers said that even with all the automation, the packers are still the most important element in the canning process. Their smooth and efficient operation ensures the success of the canning process and the ultimate product acceptance by the buying public.

The design and layout of the automated line, while at first appears to be a complicated system of conveyors, is in principle quite simple. Two controlled conveyor lines, each about 100 feet long come together for the packing process. One carries the empty cans, which have been made in an adjoining building, and the other carries the cut fish. The conveyor carrying the cans is mounted overhead, about eight feet off the floor and directly over the other conveyor carrying the fish, where the packers are located.

At the junction of the two lines, the overhead four track conveyor feeds the empty cans downward to the lower 10 track conveyor. This is done through a unique system of electronically controlled gates and in such a fashion that the cans land right side up ready for packing, and are moved on an adjacent track that is carrying the cut fish.

On the lower 10 track conveyor, five tracks serve one side of the line and the other five tracks serve the other side of the line. Each side of the line has space for five work stations

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Plans for the Future

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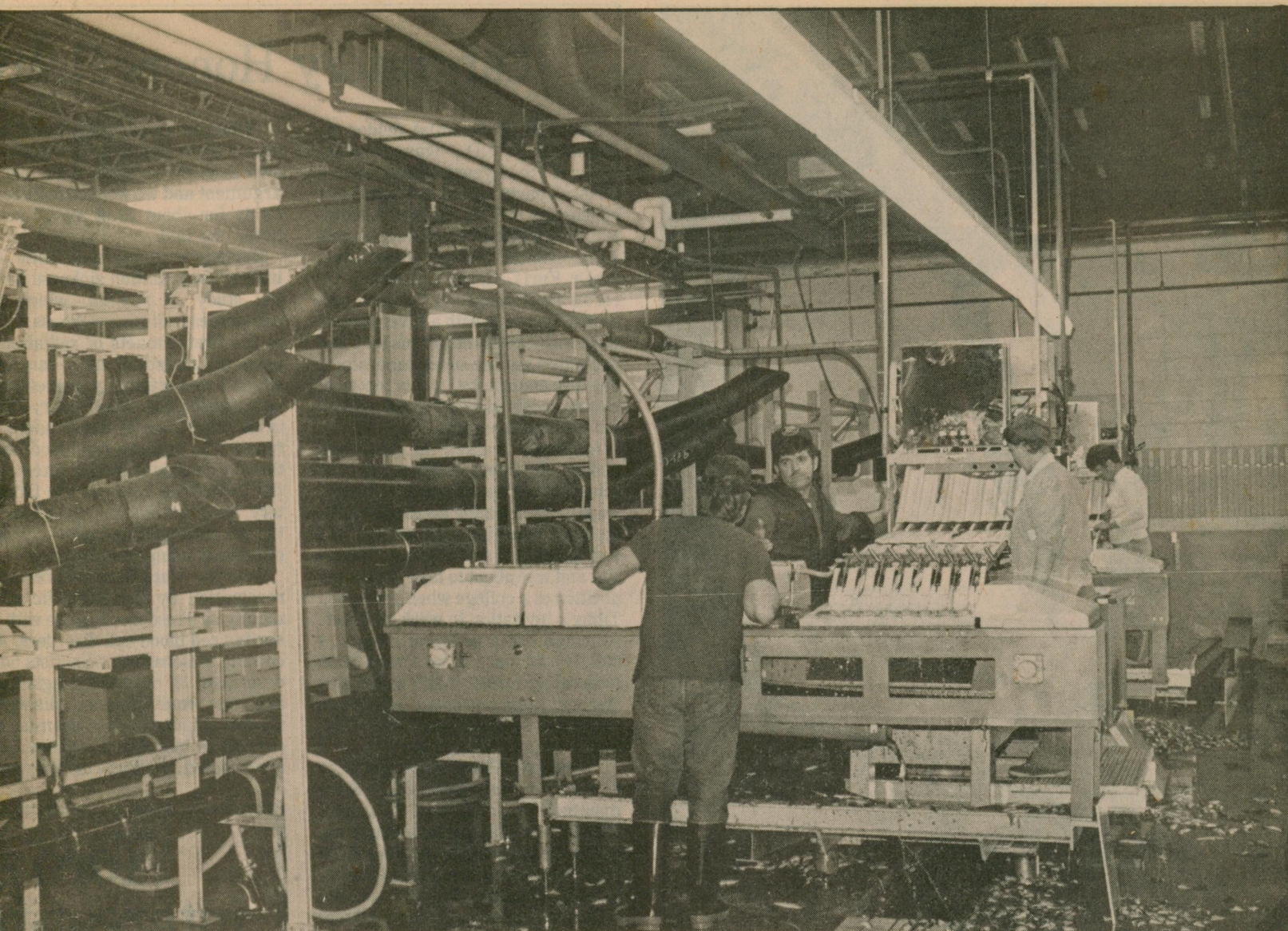
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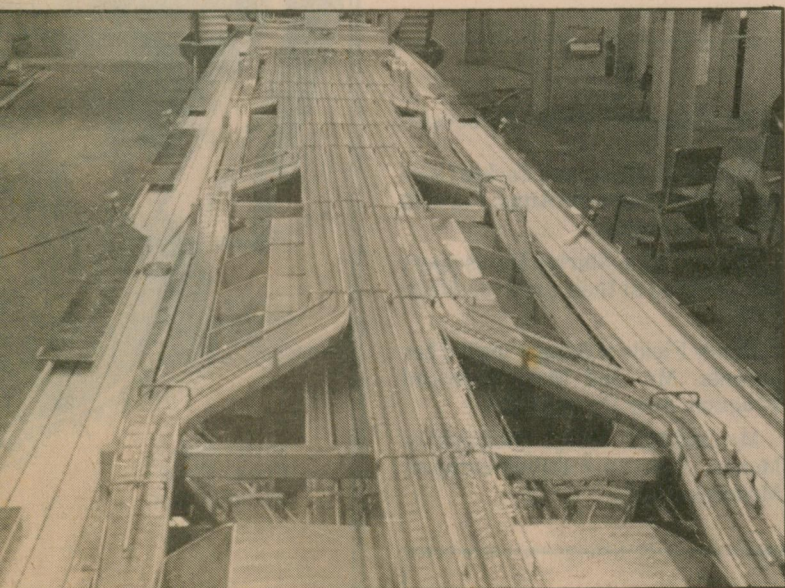
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The new automated equipment has turned the Prospect Harbor plant into a maze of piping, conveyors and other equipment essential to the process of sorting, cutting, and process-

ing sardines and fish steaks. It has taken about six months to remove the old equipment and install the new Scandinavian designed and built system.



When the plant is in operation, packers will line each side of this 10-track conveyor. Outer tracks on both sides carry the empty cans to each work station, and the white-colored outside conveyors carry the cut fish.

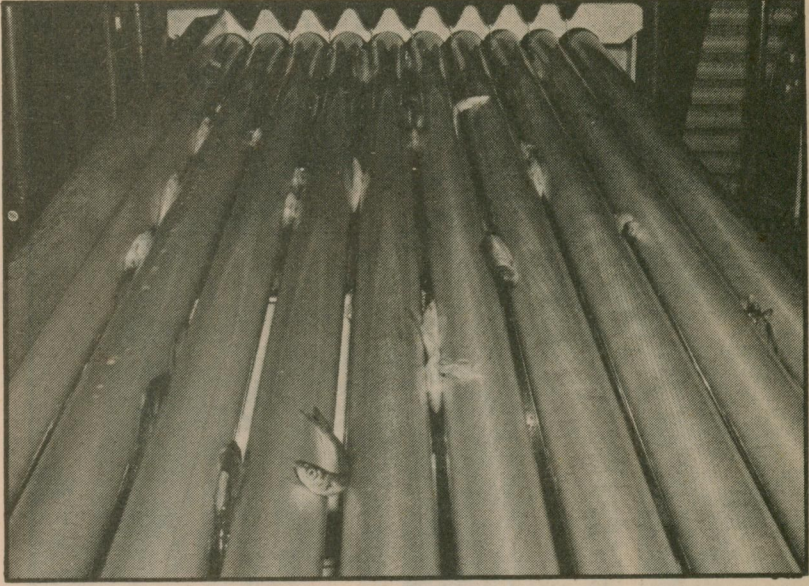


The men responsible for the design, manufacture, and installation of the new equipment include (from left) Lars Sterner, a computer expert from Sweden; Kjell Mathiassen of Norway, who worked with the cutting machines; and Willy Helgesen of Norway, whose primary role was in materials handling.





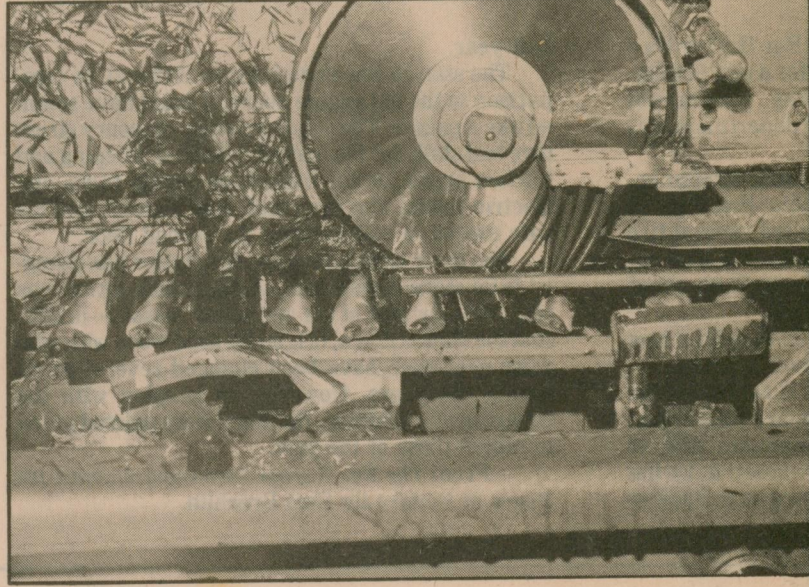
At the Prospect Harbor plant of the Stinson Canning Company, fresh or frozen fish arrive in tote boxes that are then emptied into the loading bin of the sorter which is part of the new automated equipment recently installed there. 1.



The sorters—revolving V-shaped rollers—are constructed so that the slots between the rollers become increasingly wider, allowing fish of various sizes to drop through at different points along the way. 2.

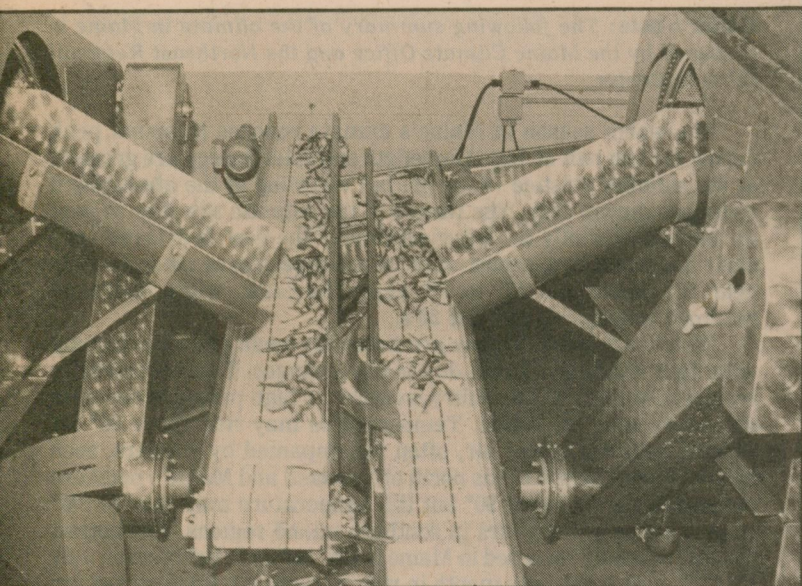


Fish are delivered to the six new cutting machines through an arrangement of pipes, and a conveyor then lifts the fish to a vibrating table where they are lined up for the cutters. 3.

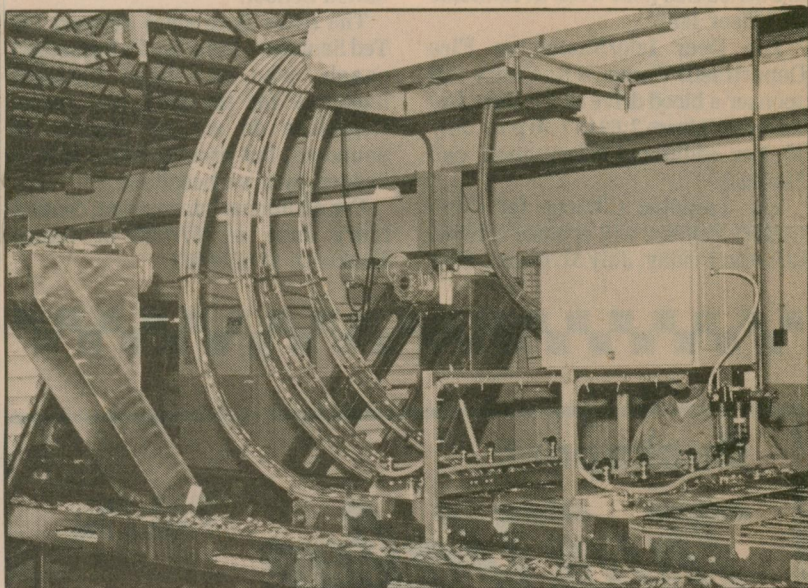


Steel cutting wheels remove the heads and tails of the fish as they move along a conveyor. No longer is the process done by scissor-wielding workers. 4.

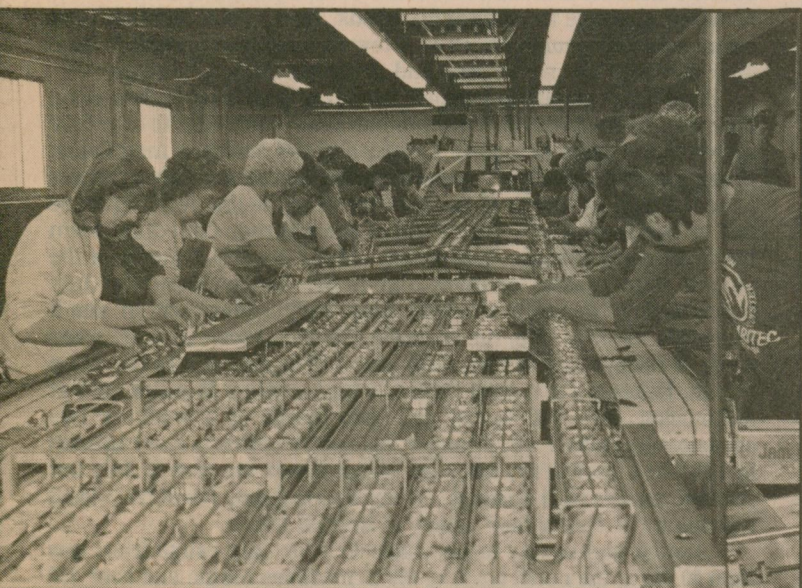




After the cutting is completed, the fish are immersed in brine tanks for about eight minutes before moving on to the packers. 5



An intricate system of electronic gates controls the flow of empty cans from the overhead four tracks to the lower ten tracks of a conveyor, and the twist in the tracks enables the cans to land right side up on the lower track. 6



Cans and fish move along on separate conveyors, and packers are positioned at work stations along both sides of the track system to fill the empty cans with fish. 7



Trays containing 25 cans of packed fish are then loaded onto portable carts and taken to the steam box for a first cooking. Sauces are then added, the cans are sealed, and the fish are cooked again. 8



# Automation Is The Key

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of four packers each, so that for any eight-hour shift at full production it is planned to have 40 packers, 20 on each side of the line.

At the first work station, the first outside track peels off from the rest and carries the empty cans to the first four packers. Here, human hands touch the fish for the first time, and with practice, they pack the fish neatly in the cans; if steaks are being packed—then it is seven or eight pieces to the can; if sardines are being packed, the number depends on the size of the fish.

At each succeeding work station down the line, tracks two, three, four, and five on each side of the line peel off and pass in front of the packers at those stations and the process is repeated. The speed of the individual conveyor line being packed at the work station is regulated by the team leader who has a control at hand for that purpose.

As both conveyor lines are controlled by computer, the master control in an adjoining room records and prints out all the pertinent data in-

cluding the number of cans packed during any given period. The 10-track conveyor and its accessories is manufactured by PLM Materials Handling, Lysekil, Sweden.

Considerable human engineering attention has been given to the well-being and comfort of the packers. Special chairs, with adjustable backs, have been designed for them to work in as well as special foot rests for their feet. An added feature is a tray of warm water in front of each packer to serve as periodic relief from handling the cold fish.

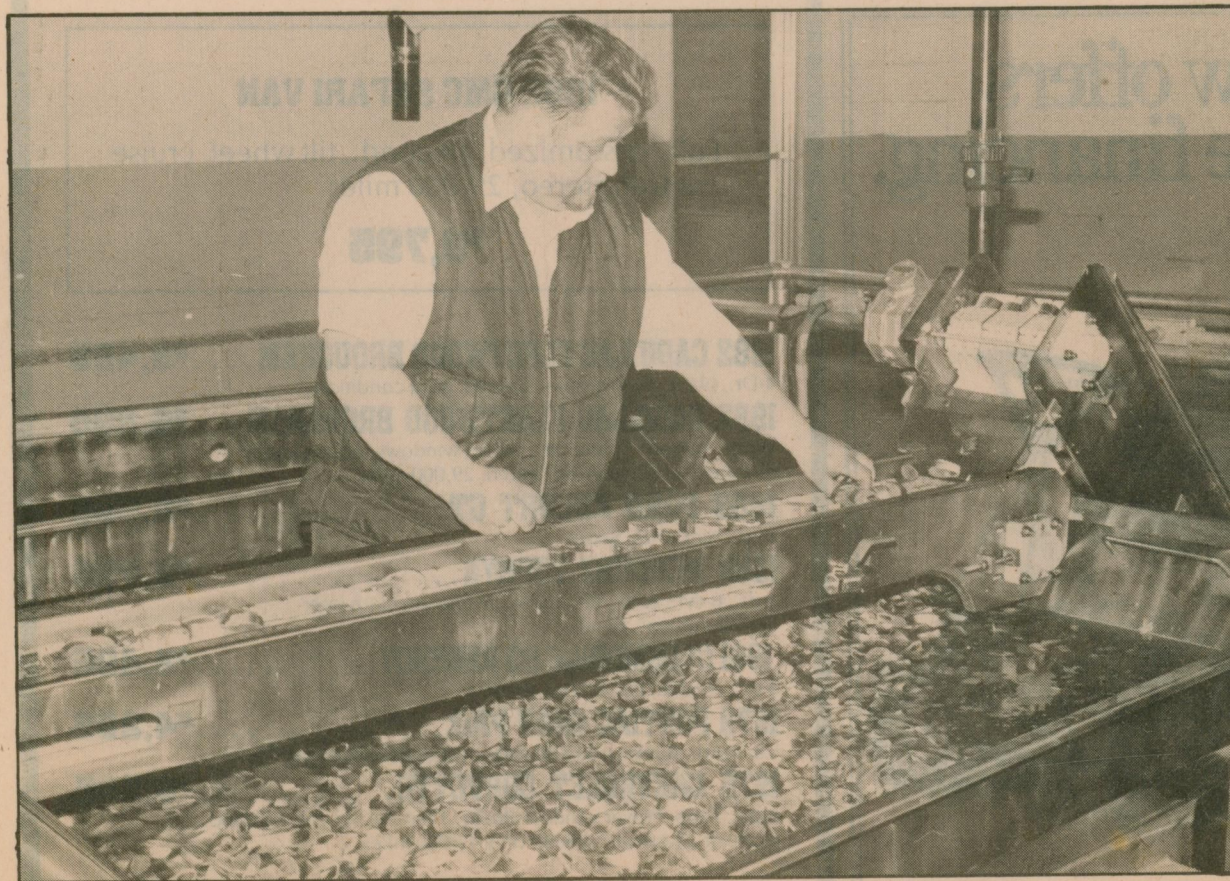
As the packed cans come off the conveyor, they are stacked in metal trays, 25 to the tray, 40 such trays are loaded on portable carts preparatory to their first cooking.

From here to the shipping department, the operations of the canning process is the same as it was under the old system before the automated line was installed. In other words, the new process applies only to the sorting, cutting, and packing of the fish.

Briefly, the remaining operations include wheeling the loaded carts with the 1,000 packed cans to the

steam box for their first cooking for about 20 minutes at 212 degrees Fahrenheit. This removes the bacteria and some of the moisture from the fish. From the oven, they are allowed to dry for about one-half hour and then placed on another conveyor where the various sauces are added and the cans are sealed with their metal tops. After sealing, the cans pass through a washer to remove any excess traces of oil or sauce. Still on the conveyor, the sealed cans move to their second cooking in the big retorts for a specific time, temperature and pressure. They get their final washing, are cooled, labeled, and move on to the shipping department.

The change-over to the Norwegian equipment has been a major change for the company. It has been made with an eye on the future. With the new automated equipment and an expected supply of incoming fish, due to the availability of frozen fish when the supply of Atlantic herring drops off, there is every reason to believe that productivity will increase and the Stinson quality will be maintained.



Every phase of the recent trial run was closely watched and checked by representatives of the designers and manufacturers of the

equipment. Norwegian engineer Willy Helgesen checked the sardine steaks coming from the cutting room.