

INDUSTRIAL REVIEW — AUS DER INDUSTRIE

UP-TO-DATE PEA PROCESSING

Canned peas, whether in jars or tin boxes, are among the favourite and most popular vegetable preserves, and in countries with advanced canning industry the quantity of canned green peas and string beans greatly outweighs that of all other kinds of vegetables, combined.

The popularity of canned peas is untested and has not been jeopardized even by the ever extending market of quick-frozen products. This fact is all the more remarkable since the canning process is one of many stages, requiring quite a series of complicated machinery.

Over and above the technical equipment needed for the canning of peas, the condition that the ripening period of the raw material is exceedingly short, imposes considerable tasks on the industry. While the ripening period of "express" peas extends over merely 18—20 days, that of the marrowfat species may be materially prolonged. To cope with the stringent restrictions of time, canning factories were compelled to set up high-capacity canning lines, in round-the-clock operation, with a feasible minimum input of labour. Processing itself calls for the performance of a series of physical and chemical processes, and the installation of bulky and complex machinery.

The harvesting of peas can be carried out either by reaping and subsequent vining of the plant, or else by handpicking, followed by podding.

The machines for podding and vining are based on identical principles: each type essentially consists of a rotating drum with

perforated jacket whose shaft, provided with beaters, rotates at a speed higher than that of the drum. The beaters, at an angle with the shaft, forward the material to the opposite end of the drum, keeping it in motion also in axial direction.

The opening of the pods is the result of a twofold effect: the beaters, in quick rotation within the drum, knock against the pods which open by the impact. The second effect, which is the bending and torsional stress arising in the drum, completes the shelling process. The fundamental principle of both podding and vining machines is to create a stress sufficient for the opening of the pods, however, not strong enough to injure the seeds. Hungarian-made viners achieve this aim by providing the drum with rubber jacket on the one hand and by adequate adjustability of the speed and the angle of the beaters, on the other.

The podders are constructed with similar flexibility in view, their drum, however, is made of wire netting.

It should be noted that the choice between vining or podding of peas is not a matter of technical but rather of economic considerations. If vining method is decided on, harvesting lends itself readily to mechanization with the input of a small crew, whereas hand-picking requires substantial manpower — a serious problem during the busiest season. True, that hand-picking affords a delay of 20 to 30 hours until processing, while podded peas are extremely perishable and do not permit a delay of more than a few hours. Should the vining method be chosen, the

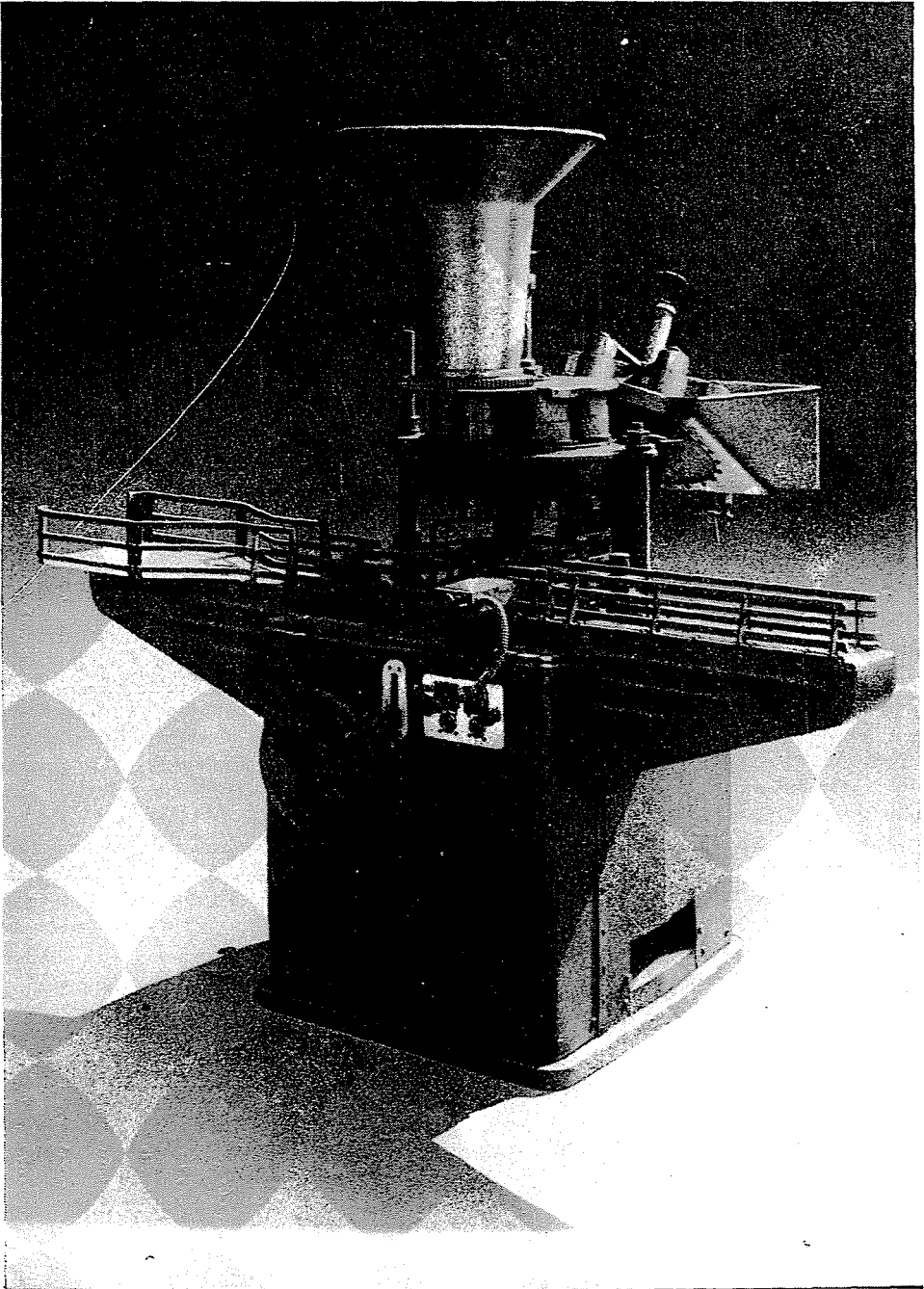


Fig. 1

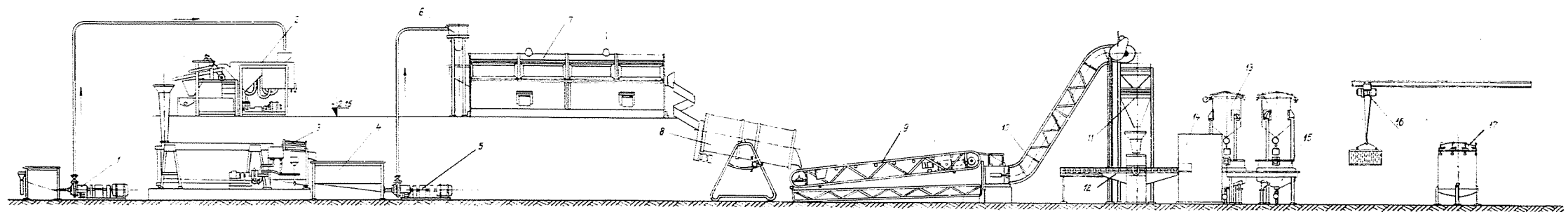


Fig. 2

machinery is generally set up in the proximity of the orchards, whereby the transportation of waste-shells, stalks and leaves (70—80 per cent.) — is eliminated.

Pea-processing plants supplied by Komplex comprise special containers for the latter harvesting method which, carried on platform lorries, are used for the delivery of the crop, in a regular and one-schedule shuttle service. Hungarian vining and podding machines are of 1000 to 1500 kg capacity per hour, the capacities of the rest of the machinery being correlated with this output.

Let us describe the process performed by a production line based on the vining principle:

Beginning with the feeding of harvested peas into the tank of the pea-pump (1), all subsequent operational stages (or, if transportation had been effected in containers, even before), peas are soaked in water and their handling is in no contact with air. The pea-pump is a centrifugal pump provided with special blades, which serves for the transportation of the pea-water mixture to a height of 8 to 10 m. Following this hydraulic delivery, the peas are being submitted to a thorough cleansing in the flotation washer (2) where leaves, stalks, pod particles, pebbles or sand are carefully removed.

The peas hence are passed on to the quality grader (3) for grading according to their specific weight. Specific weight and the stage of ripeness being in close interdependence, this method makes possible the classification of material as to its ripeness, and to submit each grade to suitable handling. It is only on ground of this grading method that for peas of different properties the proper duration of heat treatment can be set. Heat treatment without prior quality grading would result in an ununiform quality of the finished product.

The grading proper is performed by leading the peas into a saline solution in which — according to their respective specific weights — the tender peas will float on the surface while the fully ripe seeds will submerge. Each quality is subsequently lead

into separate compartments of the (4) multi-chambered tank.

The saline solution is kept in constant circulation by a pump. Its composition is maintained by adding concentrate in a quantity required to keep it at the proper level. This operation is automatically controlled, the control equipment comprising a specific-weight sensing device, a mechanical or photoelectric feeler device and the requisite switches. The specific weight of the solution is generally maintained within the 1.06 and 1.09 gr/ml range.

The material is then passed on by the pump (5) whose output is coordinated with that of the pump 1. The output of the pumps is controlled by means of variators, which ensure safe and smooth adjustment of the feeding of each equipment and in this way, of the output of the entire plant.

The water conveying the peas, is removed by the (6) separator, which takes care also of the recirculation of water into the (4) tank. For the sake of economy, both pump systems are provided with means for the recirculation and with fresh-water inlets, should the renewal of water be required.

A screw-system blancher (7) has been provided in which the duration of treatment can be set between the limits of 4 to 20 minutes by means of a stageless speed regulator, while an automatic thermostat keeps temperature at the requisite level. Temperature and duration of the process have to be set according to the properties of the species processed.

The explanation for the absence of a size-grader in this assembly lies in the generally uniform size of marrowfat peas, which makes size-grading superfluous. However, if "express" or similar species are being processed, the insertion of a 12-field size-grader would seem advisable.

Blanched peas are subsequently passed through the (8) selector for cooling and final cleansing. The selector will remove the froth of the blancher still adhering to the seeds and select broken seeds or any impurity still present in the stock.

In order to ensure a harmonious cooperation of machines and their effect, the selector is tilttable.

The stock is now forwarded to the picking table (9) where it is subjected to a quality control: blackened or yellow peas are removed and the completely cleansed stock lifted by a gooseneck elevator (10) into the tank (11) which, in turn, serves for the feeding of the filler (12).

The 40—50 p/min-capacity filler is suitable for the filling of jars or cans and is adjustable within wide limits as to the size of the containers. It is similarly adjustable as to the quantity and ratio of solids and brine.

On inserting jars or cans different from those adjusted for, or on running out of empty containers, the machine will immediately stop.

The filler can be complemented with a seamer for both jars and cans (14), and an equipment for the preparation of brine (13) by adding 1—2 per cent. salt and sugar to water.

The closed jars or cans are being sterilized in retorts, operating on the backpressure principle. The retorts are controlled from a central panel, complete with control valves, gauges and recording apparatus.

The above outlined pea-processing equipments supplied by Komplex enable hygienic and economical production. Owing to the fact that each and every unit — including even the steel construction accommodating the flotation washers and blanchers — is comprised in the complete plant, their installation does not create any difficulty whatsoever.

Constructional materials have been chosen in consideration of the most fastidious hygienic requirements, keeping in view durability as well. The canning lines delivered by Komplex rightfully claim leading role in any factory whose integral part they are to become.

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