XX (1) HOLSTEIN & KAPPERT AKTIENGESELLSCHAFT
We
4600 DORTMUND, JUCHOISTRASSE 20,

FEDERAL REPUBLIC OF GERMANY

hereby apply for the grant of a Patent for an invention entitled: (2)
"A MACHINE FOR FILLING AND SEALING CONTAINERS"

which is described in the accompanying complete specification. This application is a
Convention application and is based on the application numbered (3)
P27 07 307.0
for a patent or similar protection made in (4) GERMANY
on 19th February, 1977

Our address for service is Messrs. Edwd. Waters & Sons, Patent Attorneys,
50 Queen Street, Melbourne, Victoria, Australia.

DATED this 31st day of JANUARY, 1978

HOLSTEIN & KAPPERT AKTIENGESELLSCHAFT

by:

(5) Signature(s) of Applicant(s)

Reg'd. Patent Attorney

To: THE COMMISSIONER OF PATENTS.
In support of the Convention Application made by

HOLSTEIN & KAPPERT AKTIENGESELLSCHAFT

(hereinafter referred to as the applicant) for a Patent

for an invention entitled:

"A MACHINE FOR FILLING AND SEALING CONTAINERS"

We, Ass., Hellmuth Goldhan and Günther Smusch

of Windmühlenweg 40, 4600 Dortmund and Ludgeristraße 6,

4712 Werne, Germany

do solemnly and sincerely declare as follows:

1. I am authorised by the applicant for the patent
to make this declaration on its behalf.

2. The basic application as defined by Section 141 of the Act was

made in GERMANY

on the 19th day of FEBRUARY, 1977, by...

HOLSTEIN & KAPPERT AKTIENGESELLSCHAFT

3. Hans-Günther KROHN, Dyckhoffsweig 14, 4600

DORTMUND 50, GERMANY and Friedrich Rademacher, Kantstrasse

4, 4618 Kamen-Sudkamen, GERMANY

were the actual inventors of the invention and the facts upon which the applicant
is entitled to make the application are as follow:

The applicant is the assignee of the said inventors.

4. The basic application referred to in paragraph 2 of this Declaration
was the first application made in a Convention country in
respect of the invention the subject of the application.

DECLARED at Dortmund, Germany

this 28th day of February 1978

Signature. Holstein und Kappert

To: THE COMMISSIONER OF PATENTS.
Apparatus for filling and sealing containers having a rotating filling drum with associated filling apparatus and means for feeding containers into operative engagement with said rotating filling drum, characterised in that a removal device comprising individual members of equal spacing is conveyed from a rotatable first transfer member located at a first transfer position adjacent to the filling drum, the removal device extending away from the filling drum tangentially from the pitch circle thereof towards a container sealing apparatus including a rotatable member located at a second transfer position, the rotatable member of said sealing apparatus having a larger pitch circle diameter than the pitch circle diameter of the first transfer member, and the removal device at least partially surrounding the pitch circle diameter.
of the rotatable member of the sealing apparatus, said second transfer position having an outlet region for containers and includes a first container conveyor, the direction of movement of which is slightly inclined to the direction of movement of the removal device located adjacent to it whereby containers are transferred to the container conveyor from said removal device and carried away therefrom.
Complete Specification for the invention entitled:

"A MACHINE FOR FILLING AND SEALING CONTAINERS"

The following statement is a full description of this invention, including the best method of performing it known to:
The invention relates to a machine for filling and sealing containers, such as bottles, cans and the like, with apparatus including filling valves arranged at the periphery of a rotating filling drum and stands associated with the said valves. The apparatus also includes feed and removal devices which approach tangentially the pitch circle of the stands.

Filling machines for filling liquids into containers are preferably designed as rotating machines, i.e. the bottles which are to be filled are conveyed by a straight-line conveyor to a filling machine and, at the inlet region, are re-routed by means of transfer stars or wheels and transferred into the pitch circle of the actual filling machine. This comprises a rotating table which has lifting members for raising the bottles towards valves disposed above the said pitch circle. The diameter of such a machine (depending on the throughput) is of the order of 2 to 6m. At the outlet end of such machines, the filled bottles are again engaged by a transfer star or wheel and transferred by other guide stars or wheels into the region of a sealing machine. More particularly, with high throughputs, i.e. with high peripheral speeds, in the region of the transfer position from the filling machine to the transfer star or the inlet star of the sealing machine, appreciable liquid losses occur due to tilting of the liquid surface, and this is a cause of complaint by the consumer as the minimum level of fill is not reached. A further disadvantage of conventional system is the fact that with oxygen sensitive beverages; the repeated tilting of the liquid surface, creates an increased intake of air in the bottle neck, and this acts to the detriment of the beverage.
To avoid such drawbacks, it has already been proposed that the filling outlet be constructed obliquely with respect to the horizontal plane of movement. In this connection there is eliminated the risk of overflowing in the actual region of the filler outlet. However, the difficulties encountered in the following region, particularly at the level of the transfer position of a sealing machine, are not overcome by this proposal.

Now, while removing the drawbacks depicted, the invention aims at providing as gentle as possible a transfer from the filling machine to the sealing machine, with avoidance of a single or multiple transfer from the filling machine pitch circle to transfer positions of smaller diameter up to the larger pitch circle diameter of a sealing machine.

In accordance with the present invention there is provided apparatus for filling and sealing containers having a rotating filling drum with associated filling apparatus and means for feeding containers into operative engagement with said rotating filling drum, characterised in that a removal device comprising individual members of equal spacing is conveyed from a rotatable first transfer member located at a first transfer position adjacent to the filling drum, the removal device extending away from the filling drum tangentially from the pitch circle thereof towards a container sealing apparatus including a rotatable member located at a second transfer position, the rotatable member of said sealing apparatus having a larger pitch circle diameter than the pitch circle diameter of the first transfer member, and the removal device at least partially surrounding the pitch circle diameter of the rotatable member of the sealing apparatus, said second
transfer position having an outlet region for containers and includes a first container conveyor, the direction of movement of which is slightly inclined to the direction of movement of the removal device located adjacent to it whereby containers are transferred to the container conveyor from said removal device and carried away therefrom.

In an embodiment of the invention, it is proposed that the removal device be designed as an endless chain conveyor.

Here it has been found advantageous for a multipass straight conveyor to be provided, connected to the removal device.

With the present invention, the drawbacks enumerated in the beginning are eliminated. The filled bottles are removed tangentially from the relatively large pitch circle of the filling machines and positively conveyed in a straight line to the inlet region of the sealing machine. The pitch circle of this sealing machine is directly encircled by the removal device, i.e. the bottle-conveyor, so that further deflections, such as were necessary hitherto, are no longer required and an inclined position of the liquid level inside the bottle is avoided. The sealing machine pitch circle is here intentionally selected to be relatively large so that there will be only a slight tilting of the liquid level. However, this only occurs after the sealing plunger together with a seal have been applied to a bottle neck so that no additional intake of air or oxygen due to the continuous oscillation of the liquid level occurs.

Hereunder the invention is explained in greater detail in conjunction with a preferred embodiment of the
invention shown diagrammatically in the accompanying drawing.

The filling machine proper as well as its raising and filling components are known. Similarly, sealing machines with their sealing plungers which move up and down and which are equipped with a crown seal for sealing the bottles come under the known state of technology and are of no significance as regards the present invention.

According to the example of the embodiment illustrated in the drawing, the machine for filling and sealing containers comprises a filling machine 1 and a co-operating sealing machine 2. The actual pitch circles proper of the two machines 1 and 2 are indicated by 3 and 4. The bottles 5 which are to be filled and sealed move along the respective pitch circles 3 and 4 during rotation of the machines.

The bottles 5 to be filled first pass from a conveyor 6 into the zone of a transfer star 7 and thence on to the pitch circle 3 of the filling machine 1. Here, possibly after a pre-evacuation or pre-filling with CO₂ the bottles are filled. At the outlet region 8 of the filling machine 1 there is a removal device 9 which is designed as an endless chain conveyor and which has individual members or receiving pockets 10 which are at equal pitch. These always correspond to the contour of a bottle 5 carried by the filling machine 1. The removal device 9 is arranged tangential to the pitch circle 3 of the filling machines and is thereafter led to the pitch circle 4 of the sealing machine 2. This acts simultaneously as deflector.

In the region of the filling machines there is provided another transfer star or wheel 11 of smaller diameter.

For transferring the bottles 5 from an outlet part
12 of a transfer position of the sealing machine 2, a conveyor 13 is provided leading tangentially away. The direction of movement, that is the conveying axis 14, of the conveyor 13 is slightly inclined with respect to the conveying axis 15 of the removal device 9. In this way, a jolt free transfer of bottles from the removal device on to the conveyor 13 is effected. A multi-pass conveyor 16 is provided adjoining the removal device 9 and the conveyor 13 for further transfer of the sealed bottles. The sealing machine 2 includes a relatively large return radius which is kept larger than is the case with known machines. This characteristic also assists in conveying the bottles in an extremely gentle manner so that there is no likelihood of the liquid level being tilted.
The Claims defining the invention are as follows:

1. Apparatus for filling and sealing containers having a rotating filling drum with associated filling apparatus and means for feeding containers into operative engagement with said rotating filling drum, characterised in that a removal device comprising individual members of equal spacing is conveyed from a rotatable first transfer member located at a first transfer position adjacent to the filling drum, the removal device extending away from the filling drum tangentially from the pitch circle thereof towards a container sealing apparatus including a rotatable member located at a second transfer position, the rotatable member of said sealing apparatus having a larger pitch circle diameter than the pitch circle diameter of the first transfer member, and the removal device at least partially surrounding the pitch circle diameter of the rotatable member of the sealing apparatus, said second transfer position having an outlet region for containers and includes a first container conveyor, the direction of movement of which is slightly inclined to the direction of movement of the removal device located adjacent to it whereby containers are transferred to the container conveyor from said removal device and carried away therefrom.

2. Apparatus as claimed in claim 1, characterised in that the removal device is formed as an endless chain conveyor.

3. Apparatus as claimed in claim 1 or claim 2, characterised in that an additional multi-pass-straight conveyor is provided arranged to receive containers from said first container conveyor and removal device.

DATED THIS 9TH DAY OF SEPTEMBER, 1977.

HOLSTEIN & KAPPERT AKTIENGESELLSCHAFT.

EDWD. WATERS & SONS
Patent Attorneys,
Melbourne, Australia.