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A DEVICE FOR WITHERING TEA LEAVES IN A CONTINUOUS AND
CONTROLLED MANNER

The present invention relates to a device for withering tea leaves in a continuous and controlled manner.

There are various devices for withering of tea leaves in a controlled manner. In one type, leaf is spread thinly on tats
5 inside a room into which a blast of hot air is forced. In another type, leaf is spread at a thickness upto 25 cm on a wire mesh or some fabric mesh over the top of a horizontal duct into which a blast of hot air is forced.

In all the aforesaid devices known in the art, uniformity
10 in withering tea leaves is not achieved despite the fact that the rate of withering may be controlled by controlling the temperature of the hot air.

Another disadvantage of the known devices is that these essentially work in batches and occupy a considerably large
15 space.

The primary object of the present invention is to wither tea leaves not only in a controlled manner but also in continuous manner.

Another object of the present invention is to obtain a good
20 uniformity in withering of tea leaves.

A further object of the present invention is saving of horizontal (floor) space by utilising a larger vertical space.

The present invention relates to a device having arrangements for continuous feeding and continuous discharge and, since the
25 tea leaves are thinly spread on trays, a good uniformity in withering is obtained and the tea leaves are to be withered ————— in a controlled manner and also in a continuous manner. A very important advantage of the device according to the present invention is that the trays for the tea
30 leaves are disposed in an inclined position utilising a larger vertical space thereby saving horizontal (floor) space so that a larger vertical space is filled with tea leaves even with the

thin spread on the trays, for getting a high capacity while occupying a small area.

According to the present invention there is provided a device for withering tea leaves in a continuous and controlled manner comprising a chamber having an inlet end and an opposite end, said chamber being provided with guide rails for accommodating a plurality of trays in at least one pair of runs, each pair comprising an outward run and a return run immediately below it, said trays being inclined with respect to their direction of advance as they move along the outward and return runs; a duct for forcing hot air into said chamber; means for moving said trays through said chamber; means for carrying said trays at the end of an outward run to the next adjacent return run therebelow or from the end of a return run to any adjacent outward run therebelow; means for returning trays to said inlet end along the or each return run; and means for lifting said trays towards the top outward run, after discharging the withered tea leaves, to receive green tea leaves.

Preferably the trays for the tea leaves, in their inclined configuration have upper wheels and lower wheels. The track for the lower wheels may be wider than the track for the upper wheels.

For the purpose of lifting the trays after discharging the withered tea leaves, there is provided two chain-and-sprocket mechanisms with hooks at regular intervals. Similarly two chain-and-sprocket mechanisms with hooks

are provided for carrying the trays to a return run from an outward run thereabove. Means are provided at the end of the, or the last, return run for guiding and turning the trays upside down and for rolling the trays after turning
5 them upside down.

The present invention will now be described by way of example with reference to the accompanying drawings.

Fig. 1 shows a schematic side elevation of the device with the front cover removed;

10 Fig. 2 shows a plan view of a tray used in the device.

The chamber 1 is provided inside with a set of guide rails 2 for at least one pair of runs of trays 3 fitted with wheels 4 (Figure 2), the trays being disposed in an
15 inclined position, the wheels 4 of the trays resting on guide rails. The track 5 of the lower wheels is wider than the track 6 of the upper wheels. Two spring loaded mechanisms 7 (only one of which is shown in Figure 1) driven by respective synchronised cams 8 are provided near the inlet
20 of the chamber 1 to push the trays through the chamber on the top outward run of the trays through the chamber. There are also two chain-and-sprocket-mechanisms 9 (only one of which is shown in Figure 1), whose chains are fitted with hooks 10 at regular intervals, and two guide rails 11 (one
25 of which is omitted for clarity) extending from the top outward run inside the chamber 1, near the inlet of the chamber 1 in order to lift the trays 3 to the chamber inlet, the

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hooks 10 being arranged at such intervals that when the trays are moved along the outward run the trailing end of one tray is just above the leading end of the next tray. A mechanical spreader 12 is fitted above the guide rails 11 to charge the trays with green tea leaves. Two chain-and-sprocket-mechanisms 13 (only one of which is shown), whose chains are fitted with hooks 14, are provided at the opposite end of the chamber to carry the trays down from the top outward run to the next lower return run. Two spring loaded mechanisms 15 (only one of which is shown) driven by a pair of cams 16 are provided at this far end of the chamber 1 to push the trays during their return journey through the chamber along the return run. The total number of similar outward and return tray runs with similar mechanisms may be any 15 even number from two upwards.

At the end of the last return run, below the inlet to the chamber, is a pair of circular guides 17 (only one of which is shown schematically in Figure 1) to guide upper wheels of the trays and to invert the trays after they 20 come out from the chamber by causing their upper wheels 4 to descend to a position below. Another set of guide rails 18 is provided for the lower wheels 4. The trays roll along the guide rails 18 after turning upside down.

An air duct 19 is connected to the chamber at the 25 bottom for forcing in hot air. The air duct could instead be connected at the top or on a side.

WORKING OF THE DEVICE

Green tea leaves are fed to the mechanical spreader 12 which charges the trays 3 on the guide rails 11 while being entrained by the chain-and-sprocket-mechanisms 9 with the help of hooks 10. Each tray 3 charged with green tea leaves is driven to the inlet of the chamber 1 where the spring loaded mechanisms 7 take over and push the tray 3 and while doing so push all the preceding trays 3 further into the chamber 1. Simultaneously a tray 3 is pushed out of the chamber at the other end or opposite end and is received by the chain-and-sprocket mechanisms 13 with the help of hooks 14. These chain and sprocket mechanisms 13 carry the tray 3 down to the next lower run for a return journey of the tray through the chamber 1. The spring loaded mechanisms 15 then push the tray, and along with it all the trays ahead, into the chamber. Simultaneously a tray is pushed out of the chamber 1 at the near end, below the inlet position, and the tray is guided to swing down the circular guides 17 and to turn upside down, hence discharging the leaves on it, and then to roll down the guide rails 18, after which the tray becomes engaged by the hooks 10 of the chains of the mechanisms 9 which lift up and carry the tray to the inlet position again.

The green tea leaves during their passage through the chambers in either direction become withered by a blast of hot air supplied to the chamber 1 through the air duct 19. The degree of withering can be controlled by controlling

the temperature, and hence the humidity of the blast of air,
by varying the dwell time of the trays in the chamber with
the help of a common variable speed drive for the mechanisms
7, 9 and 15, or by varying the thickness of spread of the
5 green load by means of adjustment of the spreader 12.

CLAIMS

1. A device for withering tea leaves in a continuous and controlled manner comprising a chamber having an inlet end and an opposite end, said chamber being provided with guide rails for accommodating a plurality of trays in
5 at least one pair of runs, each pair comprising an outward run and a return run immediately below it, said trays being inclined with respect to their direction of advance as they move along the outward and return runs; a duct for forcing hot air into said chamber; means for moving said trays
10 through said chamber; means for carrying said trays at the end of an outward run to the next adjacent return run therebelow or from the end of a return run to any adjacent outward run therebelow; means for returning trays to said inlet end along the or each return run; and means for lifting said
15 trays towards the top outward run, after discharging the withered tea leaves, to receive green tea leaves.

2. A device as claimed in claim 1, wherein said trays have wheels which, in the inclined configuration of the trays are upper wheels and lower wheels.

20 3. A device as claimed in claim 2, wherein the track of said lower wheels is wider than the track of said upper wheels.

4. A device as claimed in any one of the preceding claims, wherein said means for lifting said trays
25 after discharging the withered tea leaves comprise a chain-and-sprocket mechanisms on each side of the chamber with



hooks for engaging the trays.

5. A device as claimed in claim 4, wherein said hooks are fitted at intervals such that the trailing end of one tray is above the leading end of the next tray.

5 6. A device as claimed in claims 1 to 5 wherein said means for moving said trays through the chamber comprise a spring loaded pushing mechanisms at each side of the chamber, each driven by a respective cam.

7. A device as claimed in claims 1 to 3 wherein 10 said means for carrying said trays to the lower run from the upper run comprise a chain-and-sprocket mechanism at each side of the chamber, both provided with hooks.

8. A device as claimed in any one of claims 1 to 7, wherein said means for returning said trays along the 15 return run comprise a spring loaded pushing mechanism at each side of the chamber, driven by a respective cam.

9. A device as claimed in any one of the preceding claims, including means at said inlet end of said chamber for guiding and inserting said trays from the, or 20 the last, return run and for rolling said trays thereafter.

10. A device as claimed in any one of claims 1 to 9, wherein said duct for forcing hot air into the chamber is connected to the chamber at the bottom, top or side thereof.

25 11. A device for withering tea leaves in a continuous and controlled manner substantially as herein described and with reference to the accompanying drawings.
