Sept. 21, 1943. F. F. RUAU 2,330,010

CIGARETTE MAKING MACHINE

Filed May 28, 1941 2 Sheets-Sheet 1

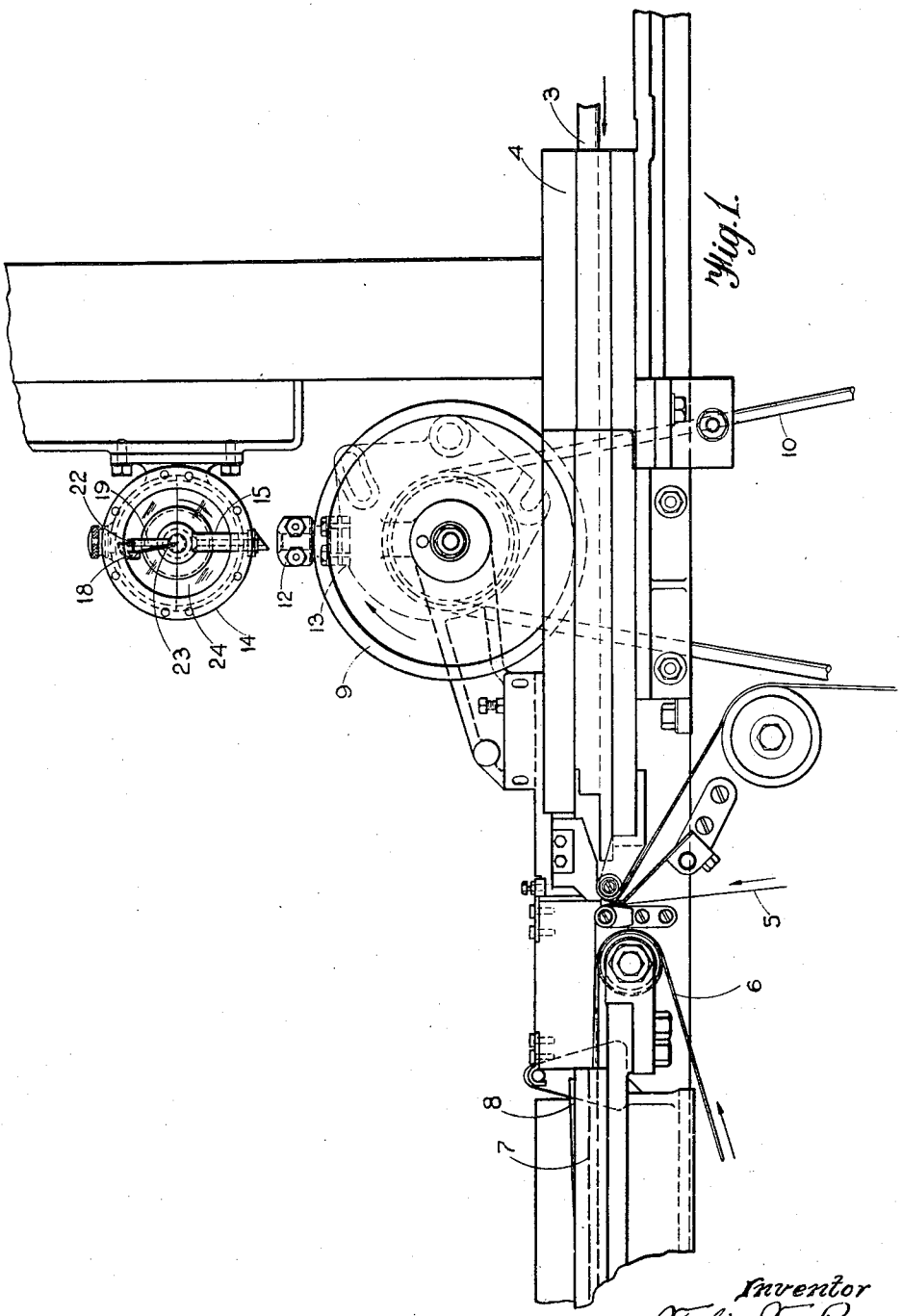



Fig. 1.

Inventor
Felix F. Ruau
By Watson, Cole, Grindle & Watson
Attorneys

Sept. 21, 1943. F. F. RUAU 2,330,010

CIGARETTE MAKING MACHINE

Filed May 28, 1941 2 Sheets-Sheet 2

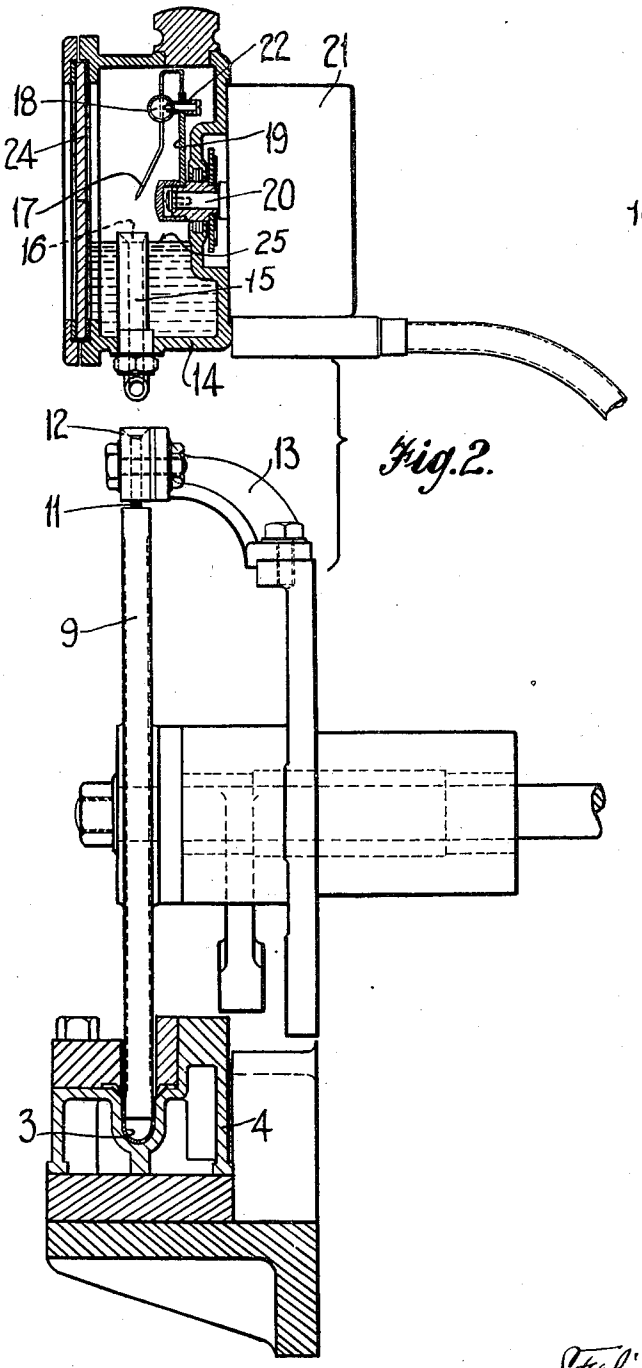
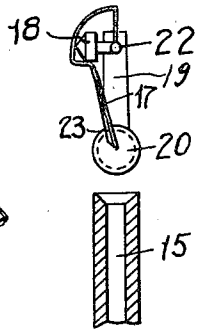



Fig. 2.

Fig. 3.




Inventor
Felix F. Ruau

By Watson, Cole, Grindle & Watson
Attorneys

Patented Sept. 21, 1943

2,330,010

# UNITED STATES PATENT OFFICE

2,330,010

## CIGARETTE-MAKING MACHINE

Félix Frédéric Ruau, Deptford, London, England, assignor to Molins Machine Company Limited, Deptford, London, England

Application May 28, 1941, Serial No. 395,666
In Great Britain June 26, 1940

16 Claims. (Cl. 131—66)

This invention concerns improvements in or relating to cigarette making machines of the continuous rod type in which a stream of tobacco is partly enveloped by a conveyor and carried thereby between compression surfaces which cooperate to reduce the cross-sectional area of the stream, the exposed portion of the stream being engaged by a stationary compression surface.

In modern continuous rod type cigarette making machines, it is usual to form a stream of tobacco on a conveyor which comprises an endless band or tape or a web of cigarette paper which is usually supported by an endless band or tape; however, for convenience of description a tape will be referred to hereafter. The tape is folded to substantially U form with the limbs of the U directed upwardly and is moved through a trough and beneath a vertical chute during which movement tobacco is showered downwardly through the chute on to the tape to form a stream of tobacco on the tape. Since the tape is of U formation the stream is partly enveloped by the tape.

After passing beyond the chute the tape carries the tobacco stream between stationary compression surfaces one of which engages the exposed portion of the tobacco stream. This latter compression surface is usually referred to as the "compression tongue" and comprises a converging or tapered member of generally U shaped cross-section providing a groove or channel therein of diminishing cross-sectional area. The tape is engaged by further stationary compression surfaces which form what is commonly known as a rod forming garniture and comprises a converging channel of substantially U shaped cross-section. The tobacco stream is moved by the tape in the direction of convergence of the tongue and garniture so that the tobacco stream is compressed and its cross-sectional area gradually reduced.

From the foregoing it will be seen that during the compression of the stream the only element which frictionally engages the tobacco is the compression tongue. It is important that the amount of that friction on the tobacco shall be reduced as far as possible during the reduction of the cross-sectional area of the tobacco by compression because there is otherwise a tendency for the stream to jam between the converging surfaces or at least for the arrangement of the tobacco strands or shreds forming the stream to become displaced with the result that the finished product is impaired.

It has previously been proposed to minimise the friction between the tobacco stream and the tongue by making the tobacco-engaging surface of the latter as smooth as possible and a further suggestion was to provide in the tongue ducts for lubricant leading to the tobacco engaging surface of the tongue. Prior proposals, however, have not proved to be entirely satisfactory and it is an object of the invention to provide an alternative means of reducing friction between the tobacco stream and the tongue.

It has also been proposed in continuous rod cigarette-making machines of the kind in which tobacco is formed into a relatively hard rod by compression rollers before the tobacco is moved beneath the compression tongue, to apply lubricant to the pressure rollers for the purpose of preventing adherence of particles of tobacco, to enable scraper elements to keep the peripheral surfaces of the roller clean. In such cases the lubricant has been applied to the periphery of the roller by a pad, to which oil was applied from time to time. No attempt was, however, made to control the quantity of oil so applied to the pad and since the merest film of lubricant on the periphery of the roller would serve the purpose intended, the pads could become almost dry before it was necessary to apply more oil to them.

It is probable, therefore, that when using this prior proposal some lubricant was, at times, transferred from the compression rollers to the tobacco and carried thereby to the compression tongue. It was not, however, appreciated that any benefit could be obtained by carrying lubricant to the tongue in that manner and in view of the fact that the pad could run almost dry, no consistent benefit could have been obtained by the prior proposal with regard to lubricating the tobacco-engaging surfaces of the tongue, because the quantity of lubricant carried by the tobacco would vary from a maximum from the time when the pad was first charged with lubricant to a minimum at the time when the pad was almost dry. In the latter case, of course, there could be no lubricating effect on the tobacco-engaging surface of the tongue, because the quantity of lubricant would be infinitesmial and of no use whatever for the purpose of lubrication of the tongue. Thus, although occasional lubrication might unintentionally have taken place in the earlier construction at times, the device was not intended to act as a lubricant for the tongue, nor was it realised that lubrication of the tongue could take place.

It is believed moreover that a major cause of the friction at the tongue is due to the pressure

of particles of adhesive which are deposited from time to time on the tongue and form a sticky film on the surface thereof. As is well known tobacco contains juices of a sticky nature and these are squeezed out by the pressure at the tongue and form a deposit.

The present invention is directed to the reduction of friction at the compression tongue by the application of a liquid to that part of a stream of tobacco which is engaged by the compression tongue prior to the stream passing beneath the tongue, but in order to obtain the desired reduction of friction it is necessary to ensure that the liquid is applied to the tobacco consistently and in controlled quantities. The liquid is intended to act as a cleansing medium to remove the film previously mentioned and naturally the presence of liquid particles tends to reduce friction quite apart from the cleansing effect.

According to the invention there is provided in a cigarette making machine of the kind described, means operable during running of the machine, to apply a liquid at a substantially uniform rate to the exposed surface of the tobacco stream prior to said exposed surface being engaged by a stationary compression surface.

Further, according to the invention there is provided in a cigarette making machine of the kind described, reserve means to maintain a reserve of liquid, a transfer-device operable during running of the machine to receive liquid from said reserve means, and to apply liquid at a substantially uniform rate to the exposed surface of the tobacco stream prior to the said exposed surface being engaged by a stationary compression surface, and supply-means operable at predetermined intervals of time to supply controlled quantities of liquid to the reserve-means.

The supply-means may comprise, a liquid container, a conduit through which liquid passes from the container to the reserve-means, the conduit being adapted to receive liquid only from a position above the liquid in the container, a drip-rod to guide liquid into said conduit, and a scoop operable after predetermined intervals of time to transfer a quantity of liquid from the container to the drip-rod. The drip-rod and the scoop may be supported for movement with a rotatable carrier. The scoop may be mounted for movement relatively to the carrier and the drip-rod for the purpose of ensuring that liquid is received by the drip-rod at a time when the latter is in a position to guide the liquid into the conduit.

A protuberance may be provided on the drip-rod to assist in forming a liquid drop which is to be guided into the conduit.

The reserve means may comprise an absorbent pad and the transfer-device may comprise a roller arranged to engage the pad and the exposed surface of the tobacco stream.

One embodiment of the invention will be described by way of example, with reference to the accompanying drawings in which:

Figure 1 is a side elevation of a part of a cigarette making machine of the kind described.

Figure 2 is an end view of a part of Figure 1 drawn to an enlarged scale and is shown partly in section.

Figure 3 shows a detail of Figure 1 drawn to an enlarged scale.

Referring to the drawings, a tape **3** is folded to substantially U form with the limbs of the U directed upwardly and the tape is moved through a trough **4** and beneath a vertical chute (not shown) during which movement tobacco is showered (by tobacco feeding apparatus not shown) downwardly through the chute on to the tape **3** to form a stream of tobacco. Since the tape **3** is of U formation the stream is partly enveloped by the tape but the upper surface of the stream is exposed.

After passing beyond the chute the tape **3** carries the tobacco stream to a position at which the tobacco stream is transferred from the tape **3** on to the surface of a cigarette-paper web **5** which is supported by a second tape **6**. The paper-web and the tape **6** are also folded to a substantially U form and carry the tobacco stream between stationary compression surfaces **7** and **8** of which surfaces the surface **8** engages the exposed surface of the tobacco stream. The compression surface **8** is usually referred to as the "compression tongue" and comprises a converging or tapered member of generally U shaped cross-section providing a groove or channel therein of diminishing cross-sectional area. The tobacco stream is moved in the direction of convergence of the tongue **8** as indicated by the arrow.

Between the position at which the tape **3** emerges from the chute and that at which it passes beneath the tongue **8** there is provided, above the stream, a positively rotated roller **9**. The roller is driven by a belt **10** from the main drive of the machine. The peripheral surface of the roller **9** is arranged to engage the exposed surface of the tobacco stream and to apply a light preliminary pressure to the stream.

The peripheral surface of the roller **9** also engages a liquid reserve which comprises an absorbent pad **11** (see Figure 2) supplied with a cleansing liquid, such as glycerine. The roller **9** acts as a transfer-device and as it rubs past the pad **11** a film of liquid is transferred to the roller and the latter in turn transfers a film of liquid to the exposed surface of the tobacco stream prior to the latter being engaged by the tongue **8**. The pad is contained in a holder **12** supported by a bracket **13**.

The pad is provided with a predetermined quantity of liquid prior to the machine being started up and thereafter the quantity is maintained by feeding additional liquid to the pad during the running of the machine.

The quantity of liquid delivered to the pad during the running of the machine is regulated so that the pad does not contain too great a quantity of the liquid. To obtain this regulation a supply of the liquid **25** is contained in a container **14** from which it is delivered to the pad at a substantially uniform rate.

The container **14** comprises a cylindrical drum mounted so that its axis is horizontal and parallel with the axis of rotation of the wheel **9**. A conduit **15** is provided through which liquid passes from the container to the pad **11** and the conduit is so arranged that it receives liquid only at the bell-mouthed end **16** which is above the height of the level of the liquid in the container. A drip-rod **17** guides liquid into the conduit and a scoop **18** delivers a quantity of liquid to the drip-rod. The drip-rod and the scoop are mounted on a rotatable carrier **19**, the latter being supported on a spindle **20**. The mechanism for rotating the spindle **20** is similar to that employed for driving the minute-hand of an electric-clock, the motor for which is contained in the box **21**.

The scoop 18 is pivoted at 22 in the carrier 19 so as to be movable relatively to the carrier and to the drip-rod. By this means liquid is delivered to the drip-rod by the scoop at a time when the drip-rod is in a position to guide the liquid into the conduit. Thus when the drip-rod and scoop reach a position about half-way between the horizontal and that shown in Figure 1, the scoop tips due to gravity and so delivers liquid to the drip-rod. The drip-rod and the scoop are so dimensioned and the carrier is so rotated that liquid is delivered to the pad at the rate of about one drop every two minutes during the running of the machine.

To assist in forming the drop to be delivered by the drip-rod to the conduit, a protuberance 23 is formed on the drip-rod, this protruberance is clearly illustrated in Figure 3.

A transparent window 24 may be provided to enable the machine operator to observe the operation of the liquid feeding apparatus. If desired, the upper portion of the window is made removable to permit adjustments to be made to the drip-rod and scoop. The window is contained in fluid tight joints.

The quantity of liquid received by the wheel 9 is determined by the nature and condition of the tobacco being worked upon, the state of atmosphere and the methods of manufacture pursued. Further, the size of the scoop and the speed of rotation of the carrier will depend on the viscosity of the liquid and on the rate at which it is desired the liquid shall be fed to the pad. The various factors will, of course, vary with individual cases.

Assuming the cigarette making machine to be operated so as to manufacture 1200 cigarettes per minute, the length of a cigarette being 70 mm., it will be clear that the quantity of liquid applied to the upper surface of the tobacco as the latter passes beneath the wheel 9 is minute since, as stated above, the liquid is delivered to the pad at the average rate of only about one drop ever two minutes. Thus, the amount of liquid which can remain on the tobacco as distinct from the metal parts is negligible, quite apart from any losses which may occur due to evaporation.

The liquid to be used is preferably a liquid which is colourless and which has no smell. By using a liquid which has no smell, one avoids the danger of the tobacco absorbing the smell should, in the even of an accident, a quantity of the liquid be spilled in the vicinity of the tobacco and not be cleaned away for some time.

What I claim as my invention and desire to secure by Letters Patent is:

1. In a cigarette making machine of the continuous rod type, a conveyor adapted partly to envelope a stream of tobacco, compression surfaces between which the tobacco is moved and which cooperate to reduce the cross sectional area of the stream, a stationary compression surface to engage the exposed portion of the stream, and means operable during running of the machine, to move with the stream and apply liquid at a substantially uniform rate to the exposed surface of the stream prior to the said exposed surface being engaged by the said stationary compression surface.

2. In a cigarette making machine of the continuous rod type, a conveyor adapted partly to envelope a stream of tobacco, compression surfaces between which the tobacco is moved and which cooperate to reduce the cross-sectional area of the stream, a stationary compression tongue to engage the exposed portion of the stream, reserve-means to maintain a reserve supply of liquid, a transfer-device operable during running of the machine to receive liquid from said reserve-means having a moving surface which is adapted to engage the stream and to apply liquid at a substantially uniform rate to the exposed surface of the tobacco stream prior to the said exposed surface being engaged by the said stationary compression tongue, and supply-means operable at predetermined intervals of time to supply controlled quantities of liquid to the reserve-means.

3. In a cigarette making machine of the continuous rod type, a conveyor adapted partly to envelope a stream of tobacco, compression surfaces between which the tobacco is moved and which cooperate to reduce the cross-sectional area of the stream, a stationary compression tongue to engage the exposed portion of the stream, reserve-means to maintain a reserve supply of liquid, a transfer-device operable during running of the machine to receive liquid from said reserve-means having a moving surface which is adapted to engage the stream and to apply liquid at a substantially uniform rate to the exposed surface of the tobacco stream prior to the said exposed surface being engaged by the said stationary compression tongue, a liquid container, a conduit through which liquid passes from the container to the reserve means, the conduit being adapted to receive liquid only from a position above the liquid in the container, a drip-rod to guide liquid into said conduit, and a scoop operable after predetermined intervals of time to transfer a quantity of liquid from the container to the drip-rod.

4. In a cigarette making machine of the continuous rod type, a conveyor adapted partly to envelope a stream of tobacco, compression surfaces between which the tobacco is moved and which cooperate to reduce the cross-sectional area of the stream, a stationary compression surface to engage the exposed portion of the stream, reserve-means to maintain a reserve supply of liquid, a transfer-device operable during running of the machine to receive liquid from said reserve-means having a moving surface which is adapted to engage the stream and to apply liquid at a substantially uniform rate to the exposed surface of the tobacco stream prior to the said exposed surface being engaged by the said stationary compression surface, a liquid container, a conduit through which liquid passes from the container to the reserve means, the conduit being adapted to receive liquid only from a position above the liquid in the container, a drip-rod to guide liquid into said conduit, a scoop operable after predetermined intervals of time to transfer a quantity of liquid from the container to the drip-rod, and a rotatable carrier on which the drip-rod and the scoop are mounted for movement therewith.

5. In a cigarette making machine of the continuous rod type, a conveyor adapted partly to envelope a stream of tobacco, compression surfaces between which the tobacco is moved and which co-operate to reduce the cross-sectional area of the stream, a stationary compression tongue to engage the exposed portion of the stream, reserve-means to maintain a reserve supply of liquid, a transfer-device operable during running of the machine to receive liquid from said reserve-means having a moving surface which is adapted to engage the stream and to

apply liquid at a substantially uniform rate to the exposed surface of the tobacco stream prior to the said exposed surface being engaged by a stationary compression tongue, the said liquid container, a conduit through which liquid passes from the container to the reserve-means, the conduit being adapted to receive liquid only from a position above the liquid in the container, a drip-rod to guide liquid into said conduit, a scoop operable after predetermined intervals of time to transfer a quantity of liquid from the container to the drip-rod, and a rotatable carrier on which the drip-rod and the scoop are mounted for movement therewith, said scoop being mounted for movement relatively to the carrier and the drip-rod for the purpose of ensuring that liquid is received by the drip-rod at a time when the latter is in a position to guide the liquid into the conduit.

6. In a cigarette making machine of the continuous rod type, a conveyor adapted partly to envelope a stream of tobacco, compression surfaces between which the tobacco is moved and which co-operate to reduce the cross-sectional area of the stream, a stationary compression tongue to engage the exposed portion of the stream, reserve-means to maintain a reserve supply of liquid, a transfer-device operable during running of the machine to receive liquid from said reserve-means having a moving surface which is adapted to engage the stream and to apply liquid at a substantially uniform rate to the exposed surface of the tobacco stream prior to the said exposed surface being engaged by the said stationary compression tongue, a liquid container, a conduit through which liquid passes from the container to the reserve-means, the conduit being adapted to receive liquid only from a position above the liquid in the container, a drip-rod to guide liquid into said conduit, a protuberance on the drip-rod to assist in forming a liquid-drop, and a scoop operable after predetermined intervals of time to transfer a quantity of liquid from the container to the drip-rod.

7. In a cigarette making machine of the continuous rod type, a conveyor adapted partly to envelope a stream of tobacco, compression surfaces between which the tobacco is moved and which co-operate to reduce the cross-sectional area of the stream, a stationary compression tongue to engage the exposed portion of the stream, reserve-means to maintain a reserve supply of liquid, a transfer-device operable during running of the machine to receive liquid from said reserve-means having a moving surface which is adapted to engage the stream and to apply liquid at a substantially uniform rate to the exposed surface of the tobacco stream prior to the said exposed surface being engaged by the said stationary compression tongue, a liquid container, a conduit through which liquid passes from the container to the reserve-means, the conduit being adapted to receive liquid only from a position above the liquid in the container, a drip-rod to guide liquid into said conduit, a protuberance on the drip-rod to assist in forming a liquid-drop, a scoop operable after predetermined intervals of time to transfer a quantity of liquid from the container to the drip-rod, and a rotatable carrier on which the drip-rod and the scoop are mounted for movement therewith.

8. In a cigarette making machine of the continuous rod type, a conveyor adapted partly to envelope a stream of tobacco, compression surfaces between which the tobacco is moved and which cooperate to reduce the cross-sectional area of the stream, a stationary compression surface to engage the exposed portion of the stream, reserve-means to maintain a reserve supply of liquid, a transfer-device operable during running of the machine to receive liquid from said reserve-means having a moving surface which is adapted to engage the stream and to apply liquid at a substantially uniform rate to the exposed surface of the tobacco stream prior to the said exposed surface being engaged by the said stationary compression surface, a liquid container, a conduit through which liquid passes from the container to the reserve-means, the conduit being adapted to receive liquid only from a position above the liquid in the container, a drip-rod to guide liquid into said conduit, a protuberance on the drip-rod to assist in forming a liquid-drop, a scoop operable after predetermined intervals of time to transfer a quantity of liquid from the container to the drip-rod, and a rotatable carrier on which the drip-rod and the scoop are mounted for movement therewith, said scoop being mounted for movement relatively to the carrier and the drip-rod for the purpose of ensuring that liquid is received by the drip-rod at a time when the latter is in a position to guide the liquid into the conduit.

9. In a cigarette making machine of the continuous rod type, a conveyor adapted partly to envelope a stream of tobacco, compression surfaces between which the tobacco is moved and which cooperate to reduce the cross-sectional area of the stream, a stationary compression tongue to engage the exposed portion of the stream, an absorbent pad to maintain a reserve supply of liquid, a transfer-device operable during running of the machine to receive liquid from said absorbent pad and to apply liquid at a substantially uniform rate to the exposed surface of the tobacco stream prior to the said exposed surface being engaged by the said stationary compression tongue, and supply-means operable at predetermined intervals of time to supply controlled quantities of liquid to the absorbent pad.

10. In a cigarette making machine of the continuous rod type, a conveyor adapted partly to envelope a stream of tobacco, compression surfaces between which the tobacco is moved and which cooperate to reduce the cross-sectional area of the stream, a stationary compression tongue to engage the exposed portion of the stream, an absorbent pad to maintain a reserve supply of liquid, a transfer-device operable during running of the machine to receive liquid from said absorbent pad and to apply liquid at a substantially uniform rate to the exposed surface of the tobacco stream prior to the said exposed surface being engaged by the said stationary compression tongue, a liquid container, a conduit through which liquid passes from the container to the absorbent pad, the conduit being adapted to receive liquid only from a position above the liquid in the container, a drip-rod to guide liquid into said conduit, and a scoop operable after predetermined intervals of time to transfer a quantity of liquid from the container to the drip-rod.

11. In a cigarette making machine of the continuous rod type, a conveyor adapted partly to envelope a stream of tobacco, compression surfaces between which the tobacco is moved and which cooperate to reduce the cross-sectional area of the stream, a stationary compression

tongue to engage the exposed portion of the stream, an absorbent pad to maintain a reserve supply of liquid, a transfer-device operable during running of the machine to receive liquid from said absorbent pad and to apply liquid at a substantially uniform rate to the exposed surface of the tobacco stream prior to the said exposed surface being engaged by the said stationary compression tongue, a liquid container, a conduit through which liquid passes from the container to the absorbent pad, the conduit being adapted to receive liquid only from a position above the liquid in the container, a drip-rod to guide liquid into said conduit, a scoop operable after predetermined intervals of time to transfer a quantity of liquid from the container to the drip-rod, and a rotatable carrier on which the drip-rod and the scoop are mounted for movement therewith, said scoop being mounted for movement relatively to the carrier and the drip-rod for the purpose of ensuring that liquid is received by the drip-rod at a time at which the latter is in a position to guide the liquid into the conduit.

12. In a cigarette making machine of the continuous rod type, a conveyor adapted partly to envelope a stream of tobacco, compression surfaces between which the tobacco is moved and which cooperate to reduce the cross-sectional area of the stream, a stationary compression tongue to engage the exposed portion of the stream, an absorbent pad to maintain a reserve supply of liquid, a transfer-device operable during running of the machine to receive liquid from said absorbent pad and to apply liquid at a substantially uniform rate to the exposed surface of the tobacco stream prior to the said exposed surface being engaged by the said stationary compression tongue, a liquid container, a conduit through which liquid passes from the container to the absorbent pad, the conduit being adapted to receive liquid only from a position above the liquid in the container, a drip-rod to guide liquid into said conduit, a protuberance on the drip-rod to assist in forming a liquid-drop, and a scoop operable after predetermined intervals of time to transfer a quantity of liquid from the container to the drip-rod.

13. In a cigarette making machine of the continuous rod type, a conveyor adapted partly to envelope a stream of tobacco, compression surfaces between which the tobacco is moved and which cooperate to reduce the cross-sectional area of the stream, a stationary compression tongue to engage the exposed portion of the stream, an absorbent pad to maintain a reserve supply of liquid, a roller operable during running of the machine to receive liquid from said absorbent pad and to apply liquid at a substantially uniform rate to the exposed surface of the tobacco stream prior to the said exposed surface being engaged by the said stationary compression tongue, and supply-means operable at predetermined intervals of time to supply controlled quantities of liquid to the absorbent pad.

14. In a cigarette making machine of the continuous rod type, a conveyor adapted partly to envelope a stream of tobacco, compression surfaces between which the tobacco is moved and which cooperate to reduce the cross-sectional area of the stream, a stationary compression tongue to engage the exposed portion of the stream, an absorbent pad to maintain a reserve supply of liquid, a roller operable during running of the machine to receive liquid from said absorbent pad and to apply liquid at a substantially uniform rate to the exposed surface of the tobacco stream prior to the said exposed surface being engaged by the said stationary compression tongue, a liquid container, a conduit through which liquid passes from the container to the absorbent pad, the conduit being adapted to receive liquid only from a position above the liquid in the container, a drip-rod to guide liquid into said conduit, and a scoop operable after predetermined intervals of time to transfer a quantity of liquid from the container to the drip-rod.

15. In a cigarette making machine of the continuous rod type, a conveyor adapted partly to envelope a stream of tobacco, compression surfaces between which the tobacco is moved and which cooperate to reduce the cross-sectional area of the stream, a stationary compression tongue to engage the exposed portion of the stream, an absorbent pad to maintain a reserve supply of liquid, a roller operable during running of the machine to receive liquid from said absorbent pad and to apply liquid at a substantially uniform rate to the exposed surface of the tobacco stream prior to the said exposed surface being engaged by the said stationary compression tongue, a liquid container, a conduit through which liquid passes from the container to the absorbent pad, the conduit being adapted to receive liquid only from a position above the liquid in the container, a drip-rod to guide liquid into said conduit, a scoop operable after predetermined intervals of time to transfer a quantity of liquid from the container to the drip-rod, and a rotatable carrier on which the drip-rod and the scoop are mounted for movement therewith, said scoop being mounted for movement relatively to the carrier and the drip-rod for the purpose of ensuring that the liquid is received by the drip-rod at a time when the latter is in a position to guide the liquid into the conduit.

16. In a cigarette making machine of the continuous rod type, a conveyor adapted partly to envelope a stream of tobacco, compression surfaces between which the tobacco is moved and which co-operate to reduce the cross-sectional area of the stream, a stationary compression tongue to engage the exposed portion of the stream, an absorbent pad to maintain a reserve supply of liquid, a roller operable during running of the machine to receive liquid from said absorbent pad and to apply liquid at a substantially uniform rate to the exposed surface of the tobacco stream prior to the said exposed surface being engaged by the said stationary compression tongue, a liquid container, a conduit through which liquid passes from the container to the absorbent pad, the conduit being adapted to receive liquid only from a position above the liquid in the container, a drip-rod to guide liquid into said conduit, a protuberance on the drip-rod to assist in forming a liquid-drop, and a scoop operable after predetermined intervals of time to transfer a quantity of liquid from the container to the drip-rod.

FÉLIX FRÉDÉRIC RUAU.