March 25, 1930. J. L. ANDERSON 1,752,139

TORCH APPARATUS AND CARTON SEALING MACHINE

Filed Dec. 7, 1927 4 Sheets-Sheet 1

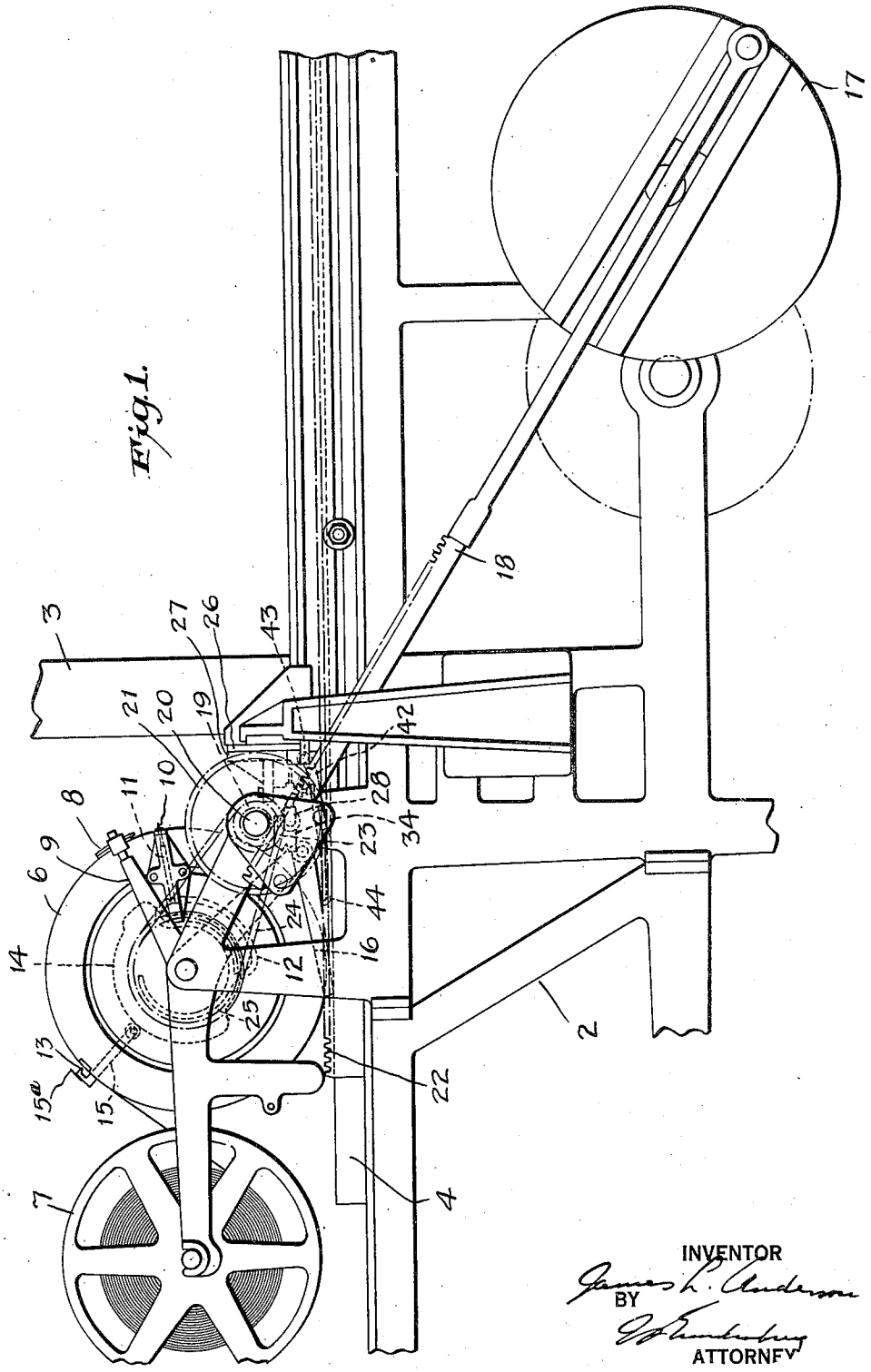



Fig. 1.

INVENTOR
James L. Anderson
BY
ATTORNEY

March 25, 1930. J. L. ANDERSON 1,752,139

TORCH APPARATUS AND CARTON SEALING MACHINE

Filed Dec. 7, 1927 4 Sheets-Sheet 2

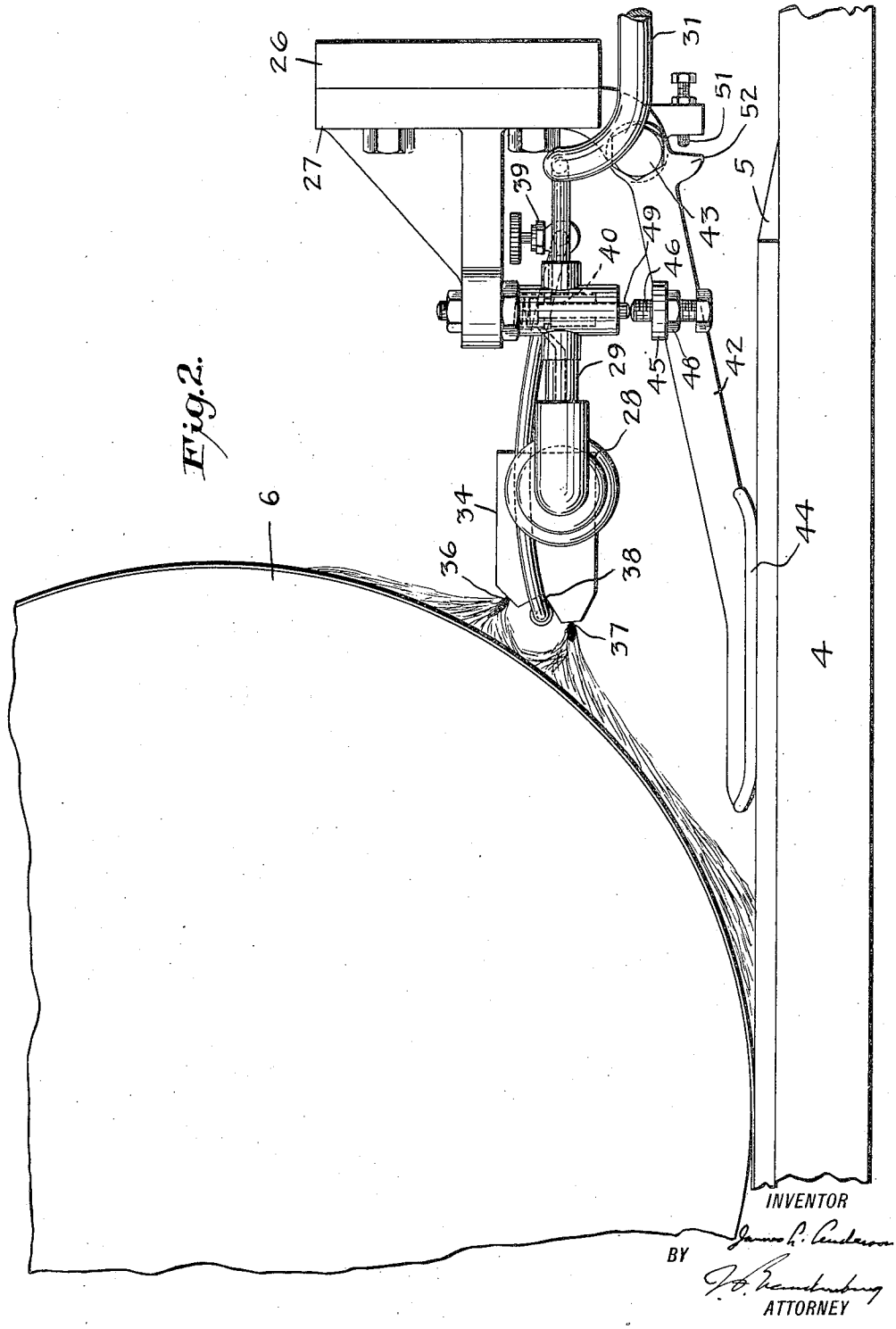



Fig.2.

INVENTOR

James L. Anderson

BY

J. L. Ramsburg

ATTORNEY

March 25, 1930. J. L. ANDERSON 1,752,139

TORCH APPARATUS AND CARTON SEALING MACHINE

Filed Dec. 7, 1927 4 Sheets-Sheet 3

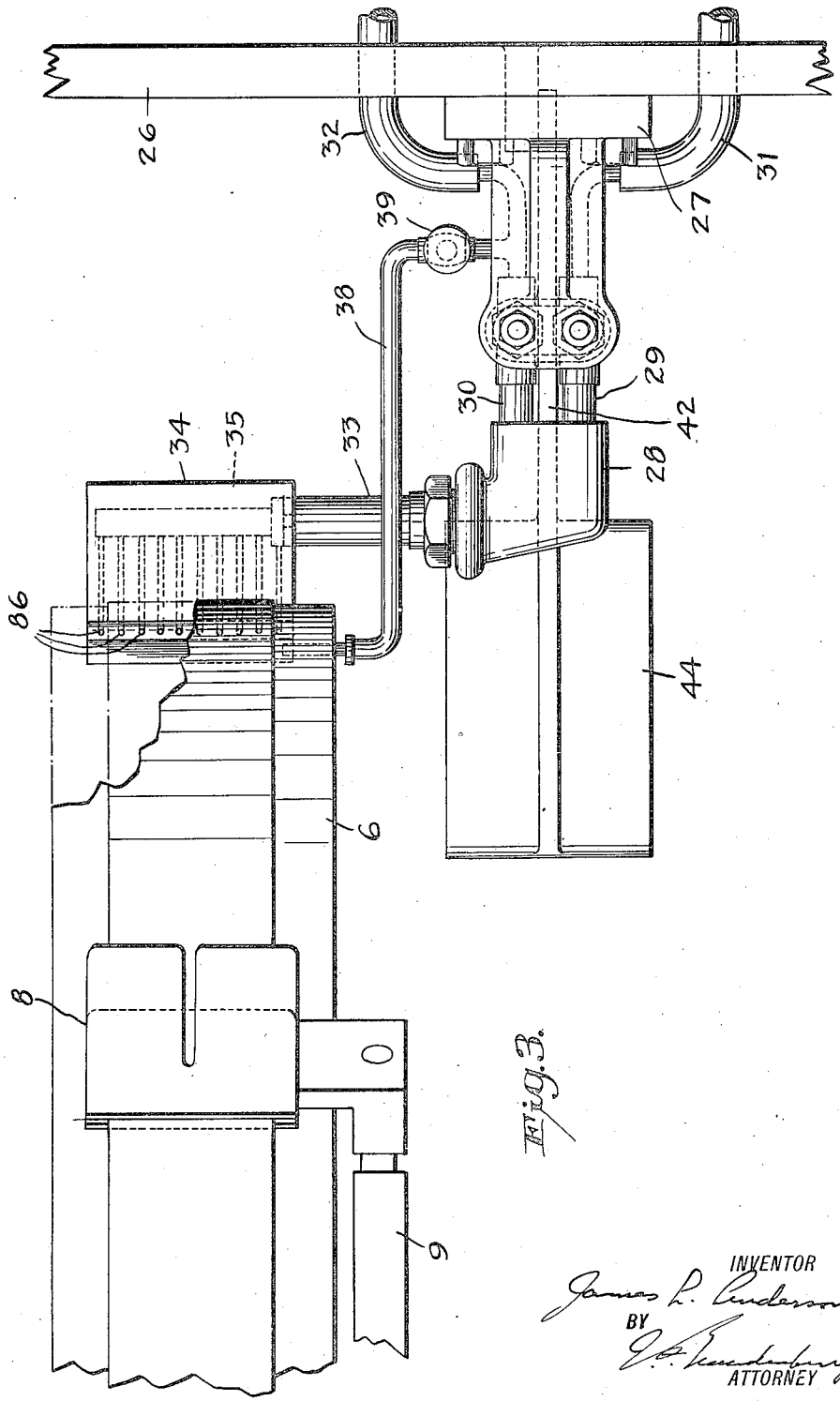



Fig. 3.

INVENTOR
James L. Anderson
BY
E. A. Lundenburg
ATTORNEY

March 25, 1930. J. L. ANDERSON 1,752,139

TORCH APPARATUS AND CARTON SEALING MACHINE

Filed Dec. 7, 1927 4 Sheets-Sheet 4

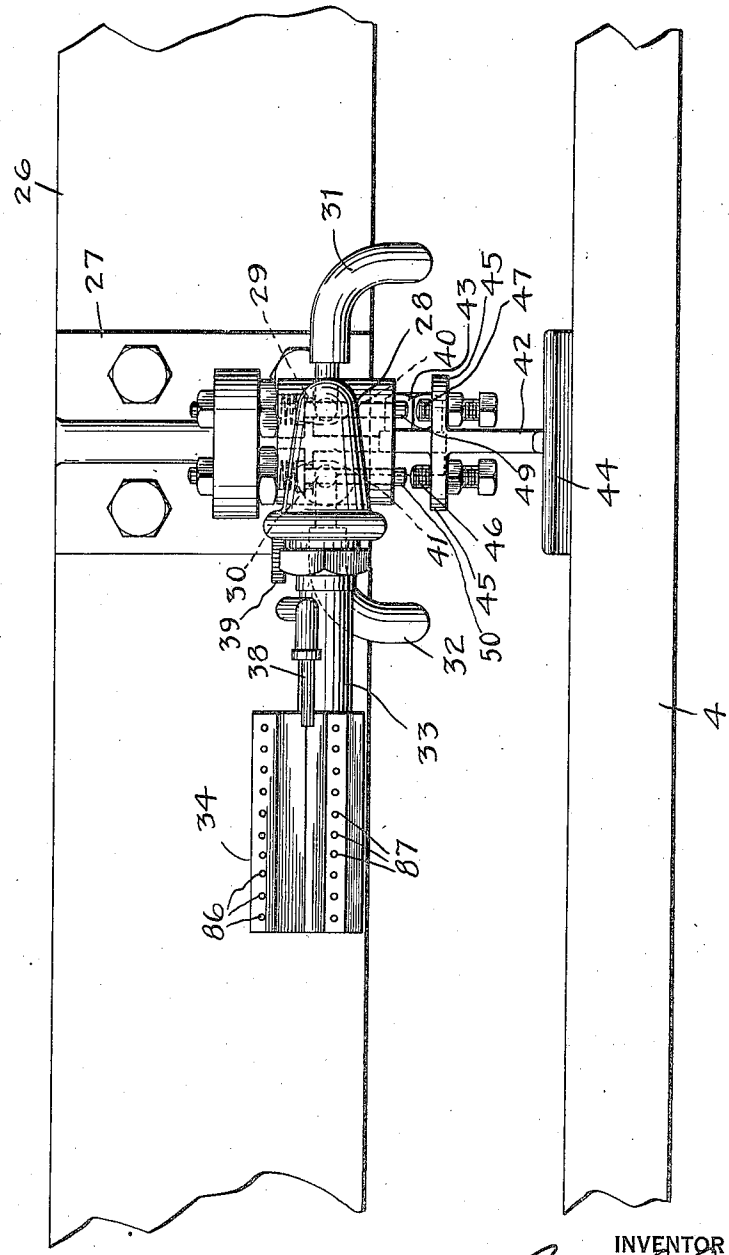



Fig. 4.

INVENTOR
James L. Anderson
BY
W. Lindenberg
ATTORNEY

Patented Mar. 25, 1930 1,752,139

# UNITED STATES PATENT OFFICE

JAMES L. ANDERSON, OF TENAFLY, NEW JERSEY, ASSIGNOR TO AIR REDUCTION COMPANY, INCORPORATED, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK

## TORCH APPARATUS AND CARTON-SEALING MACHINE

Application filed December 7, 1927. Serial No. 238,452.

The invention relates to torch or blowpipe apparatus, and to an improvement in machines for applying sealing strips to cartons wherein heat is required to soften and render adhesive the bitumastic or like compound with which the sealing strips are impregnated.

In such a machine, the cartons are fed intermittently and the tapes are applied thereto by a turning or oscillating drum, and each tape requires to be heated while on the drum as the tape approaches the carton and as it is progressively applied. The speed at which the machine operates allows only a very brief period, possibly a fraction of a second, in which to heat the tape, and the drum and the instrumentalities carried thereby are subject to injury or derangement if they become overheated. Furthermore, the compound carried by the tape, or with which it is impregnated, cools and solidifies rapidly. The space in the machine within which heating arrangements can be placed to direct heat against the tape on the periphery of the drum is also likely to be restricted.

In the machine herein described there is a burner apparatus capable of intermittent and rapid heating, the heating flame being extinguished when or after the length of each tape has been heated and being restored in time to act upon the next strip, the drum or other part of the machine not being exposed to heat in the intervals.

A further object is to control the turning on and off of the heating flame by the cartons in such manner that the fuel gas is turned on ahead of the oxygen.

A further object is to so construct the tip part of an oxygas, oxyacetylene or like torch constituting the burner, that the heat is caused to act at one time over a considerable length of each sealing strip, the construction of the burner and the relation between the same and the tape carrier also being such that heat is supplied to the surface of the carton, so that the surface to which the tape is to be applied becomes preheated. In particular, the tip or block from which the flame issues is formed with a plurality of sets, or transverse rows, of jet orifices, so disposed that the heat from one set is directed or deflected against the tape and in a rearward direction along the same, while the heat from another set is directed more in the direction of travel of the tape, and in the confined and narrowing space between the tape carrier and the carton imparts a useful degree of heat to the latter. The arrangement of the flame jet orifices may be varied, and the number of sets or rows of orifices may be increased to distribute and extend the region of direct heating of the sealing strip, and/or to preheat the strip and/or the carton by convection.

A further object is to provide a very compact burner and burner control apparatus suitable for the purpose intended, and one which does not require a large flame.

While the invention has been more particularly designed for, and is hereinafter claimed in connection with, a machine for applying sealing strips to cartons, it embodies aspects which are applicable to other machines in which intermittent and rapid heating would be desirable.

In the accompanying drawings forming part hereof:

Fig. 1 is a side elevation of a carton-sealing machine in which the invention is embodied;

Fig. 2 is a fragmentary elevation on a larger scale showing the parts more particularly concerned in the invention;

Fig. 3 is a plan view corresponding to Fig. 2, a portion of the drum being broken away to better illustrate the burner; and

Fig. 4 is a front elevation of the burner, its mounting, and parts for controlling the burner.

The carton sealing machine illustrated in these drawings has a frame 2, at one end of

which is a magazine 3 to hold a stack of flat folded cartons. There is a reciprocatory bed support or carrier 4 for the cartons, this bed having a pusher projection 5 toward one end for advancing the cartons one at a time from the bottom of the stack beneath a drum 6.

This drum, suitably mounted to turn on the frame, constitutes the tape carrier. The supply of tape is held in a reel or holder 7, from which it passes over the top of the drum. A device 8 comprising a pair of slotted plates supported by a stationary arm 9 retains the forward end of the tape supply in a position to be engaged by a pin 10 carried by the drum. This pin is mounted on a suitable reciprocatory part 11 guided in the drum and controlled by a stationary cam 12, to cause the pin to be projected beyond the periphery of the drum and to be retracted at the proper times. 13 is a knife or cut-off device also carried by the drum and controlled by a stationary cam 14, the knife being carried by a reciprocatory rod 15 supported and guided on one side of the drum.

The drum is oscillated, and the arrangement is such that at or about the end of each return movement the pin 10 is projected to engage the end of the tape held by the slotted plates 8, whereupon the drum turns in the forward direction dragging the tape around with it and laying it on its circumference. The knife 13 clears the device 8 and is then drawn inward or downward below or flush with the periphery of the drum, so as to sever the proper length of tape from the supply. A small finger 15ª on the knife holds the rear end of the tape against the drum while the severed length of tape is being carried forward and applied to the carton.

On the return stroke of the bed 4, the carton to which the sealing strip has just been applied is detained against being dragged back, by a detent 16. The advance of the next carton ejects the sealed carton from the machine.

The parts are driven from a suitable source of power through an adjustable crank wheel 17 and a rack pitman 18. The rack teeth mesh with a gear wheel 19 on a shaft 20, and other toothed wheels 21 on this shaft mesh with racks 22 on the reciprocating bed 4. A sprocket wheel 23 is also secured to the shaft 20, a sprocket chain 24 passing about this wheel and a wheel 25 fixed to the drum 6.

The carton supporting means and the sealing strip supporting means are placed close enough together at the region of tangency so that the compression of the cartons between them gives the proper pressure for pressing the sealing strips against the cartons.

It will be evident that the form of the parts of the machine, their movements and the mechanism for operating them may be widely varied. I do not claim the machine thus far described as my invention, and it has been shown as one illustrative embodiment of an organization of instrumentalities for the purpose of applying sealing strips to cartons to which my invention is applicable, and for which it has been more particularly designed.

My improvement in such a machine relates to the means for heating the tape, and preferably, also, preheating the cartons.

On a bar or frame part 26 at the front and near the lower part of the magazine 3 there is bolted a bracket 27, and to this bracket there is fixed the body of a torch 28 of the oxyacetylene or oxygas type. This torch has conduit pipes 29 and 30 for oxygen and the combustible gas, respectively, these pipes being connected with suitable sources of supply of the two gases by hose 31 and 32. The gases are brought together and mixed by known provisions inside the torch. In the form of torch illustrated they are brought together in the rear part of the shank 33 of a detachable tip, which carries a tip block 34 containing a chamber 35 for the mixed gases.

Two spaced rows 86 and 87 of small jet orifices are drilled in the block to intersect the chamber 35. The rows of orifices or exits extend transversely with reference to the periphery of the drum, and the torch is so supported by its bracket that the orifices are adjacent this periphery at what may be termed the lower front quarter position thereof. Terms of orientation are, of course, relative, as it is not absolutely essential that the cartons lie horizontal. The region is where the periphery of the drum curves inward toward the point of tangency between the cartons and the drum or tape carrier.

The jets 36 of the upper row are inclined upward so that their jets are directed radially toward the drum, or they may be inclined somewhat rearward of the radius drawn from the center of the drum. The terms forward and rearward refer to the direction of movement of the tape as it is carried around and applied to the carton.

The jets 37 of the lower row are shown directed substantially horizontally or somewhat downward, at a forward inclination to a radial line. The precise spacing, positions and inclination of the jets, and the number of rows or groups can naturally be varied. It is advantageous to space the jets, or to cause them to diverge, so as to extend the zone of direct heating over a certain part of the length of the sealing strip at the same instant,—also, and very importantly to cause the conveyed heat to be deflected and flow rearwardly over the tape on the periphery of the drum, preheating the same as it approaches the region of direct intense heating, and to cause another portion of the heat to be directed or to flow and be carried forwardly over the tape, and downwardly to preheat the

surface of the carton itself just as it is about to receive the tape.

The face of the block 34 is preferably recessed between the rows of jet orifices, to form a channel into which the end of a pilot flame tube 38 is directed. This tube is branched from the fuel gas pipe 30 and is provided with a regulating valve 39.

The two conduits 30 and 31 are provided with opening and closing valves 40 and 41, preferably spring-closing. The pilot tube is connected with the fuel gas pipe 30 at a point before the gas reaches the shut-off valve 41.

An arm 42 is pivoted at 43 to the bracket 27, extending forward and downward, and carrying at its forward end a feeler shoe 44, which is so positioned that the cartons as they approach the tape carrier must pass beneath it, thereby raising the yieldingly mounted feeler.

The arm 42 has portions or lugs 45 in which are threaded adjustable contact screws 46, 47 having lock nuts 48. These screws are in line with the lower ends of the stems 49, 50 of the valves 40 and 41, so that when the arm is raised, the screws contact with the valve stems and open the valves. When a carton passes out from beneath the feeler the feeler and arm drop, permitting the valves to close again.

When the valves are opened the jets issuing from the jet orifices are automatically ignited by the pilot. In order to prevent backfiring or inefficient functioning of the flame in the brief period allowed for its work, it is important to turn on the fuel gas a little ahead of the oxygen. In the illustrative embodiment this is provided for in the members 46, 47, which are set relatively to each other so that the fuel gas valve is opened, or starts to open, an instant before the oxygen valve is opened.

A screw abutment 51 cooperative with a shoulder 52 on the arm 42 keeps the feeler from dropping too far down in cases where the carton carrier does not present a continuous surface for the feeler to rest on.

It will thus be seen that the working flame is turned on as the leading flaps of the carton approach the point where the tape is laid or pressed on the body of the carton. The machine is so set or adjusted that the forward end of the length of tape arrives at the bottom point of the circuit of the drum just when the forward end of the open joint in the body of the carton reaches this point. The forward part of the tape has already been heated by radiation and convection, and the surface of the forward part of the carton has also been preheated by convection and to some extent by radiation. Before the application of the tape commences, and thereafter while the tape is being progressively applied, the portions thereof approaching the point of application are progressively heated, and the surface of the carton is likewise progressively heated. An effective preheating of the carton is of great importance, as otherwise the tape will not adhere properly.

When the rear end of the carton passes out of contact with the feeler, the working flame is automatically extinguished, to be automatically restored slightly before the leading end of the next tape length reaches the region of direct heating.

The heat of the flame jets is very intense, and performs its work very rapidly in time with the quick intermittent operation of the machine, but the heating is so controlled as not to injure parts of the machine.

I claim:

1. In a machine for applying sealing tapes to cartons, comprising a tape carrier, and means for supporting the cartons in operative relation to the tape carrier and for turning the tape carrier and producing relative translational movement between the tape carrier and the cartons, blowpipe means and a support for the same, said blowpipe means being supported adjacent the periphery of the tape carrier and comprising means for delivering a plurality of sets of jets, so arranged as to heat the tape on the tape carrier and also to supply heat to the surface of the carton.

2. In a machine for applying sealing tapes to cartons, comprising a tape carrier, and means for supporting the cartons in operative relation to the tape carrier and for turning the tape carrier and producing relative translational movement between the tape carrier and the cartons, an oxygas blowpipe and a support therefor, said blowpipe having a tip supported adjacent the lower front quarter position of the tape carrier, and formed with two transverse rows of jet orifices in divergent relation to each other.

3. In a machine in which pieces of work are fed intermittently to have an operation requiring heat performed thereon, the combination of a blowpipe designed to operate with a mixture of a fuel gas and a gaseous supporter of combustion, means for automatically igniting the working flame delivered by the blowpipe, conduits for the two gases, valve means in said conduits for turning on and off the gases which supply said flame, and automatic means for causing the blowpipe to operate intermittently comprising a device adapted to be controlled by the pieces of work, and an operative connection between said device and said valve means, said operative connection including parts associated with the respective parts of the valve means, the relation between which parts is such that one valve is opened ahead of the other.

4. The combination of a blowpipe burner, separate conduits for supplying the same with fuel gas and a gaseous supporter of combustion, a pilot, separate valves in said conduits, a

feeler adapted to contact with pieces of work, an arm connected with said feeler, and means between said arm and said valves to cause one valve to open ahead of the other.

5. In a machine for applying sealing tapes to cartons, comprising a tape carrier, and means for supporting the cartons in operative relation to the tape carrier and for turning the tape carrier and producing relative translational movement between the tape carrier and the cartons, oxygas blowpipe means so supported and arranged as to heat the tape on the tape carrier and also definitely to preheat the surface of the carton.

JAMES L. ANDERSON.