Jan. 4, 1966 P. G. WILSON 3,227,597

WRAPPING MACHINERY

Filed Oct. 1, 1963 4 Sheets-Sheet 1

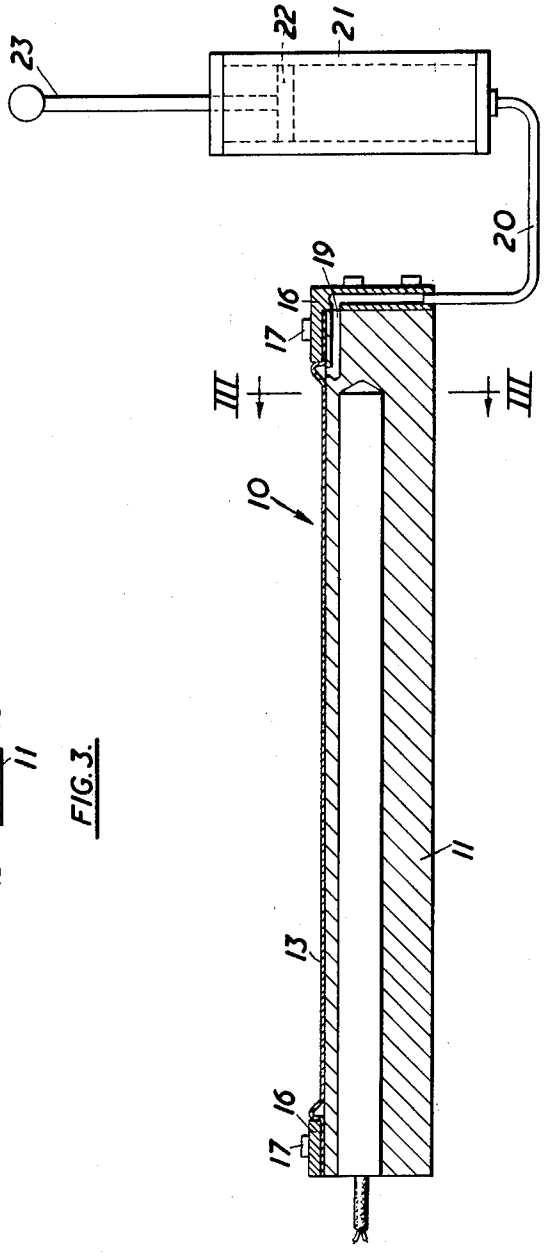


FIG. 1.

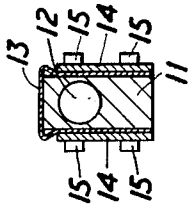


FIG. 3.

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WRAPPING MACHINERY

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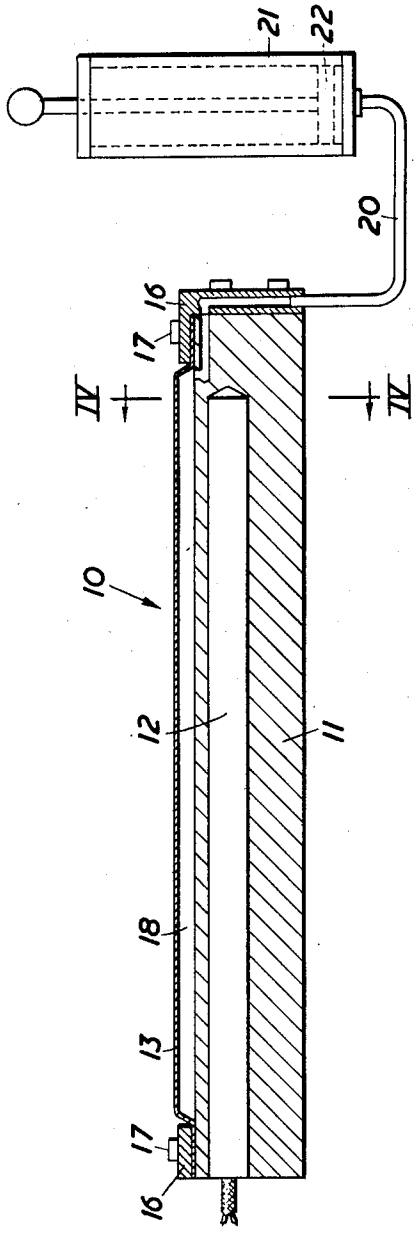


FIG. 2.

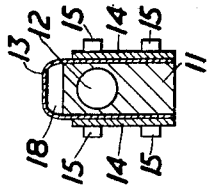


FIG. 4.

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WRAPPING MACHINERY

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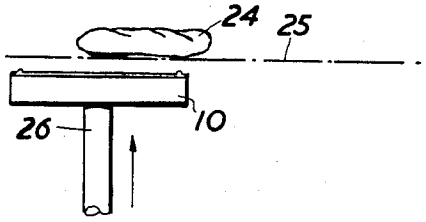


FIG. 5.

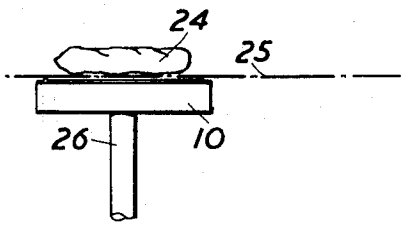


FIG. 6.

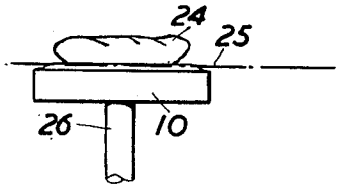


FIG. 7.

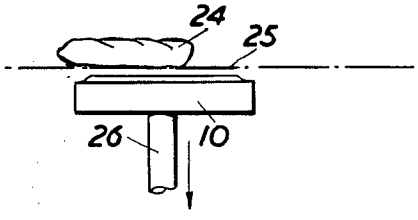


FIG. 8.

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WRAPPING MACHINERY

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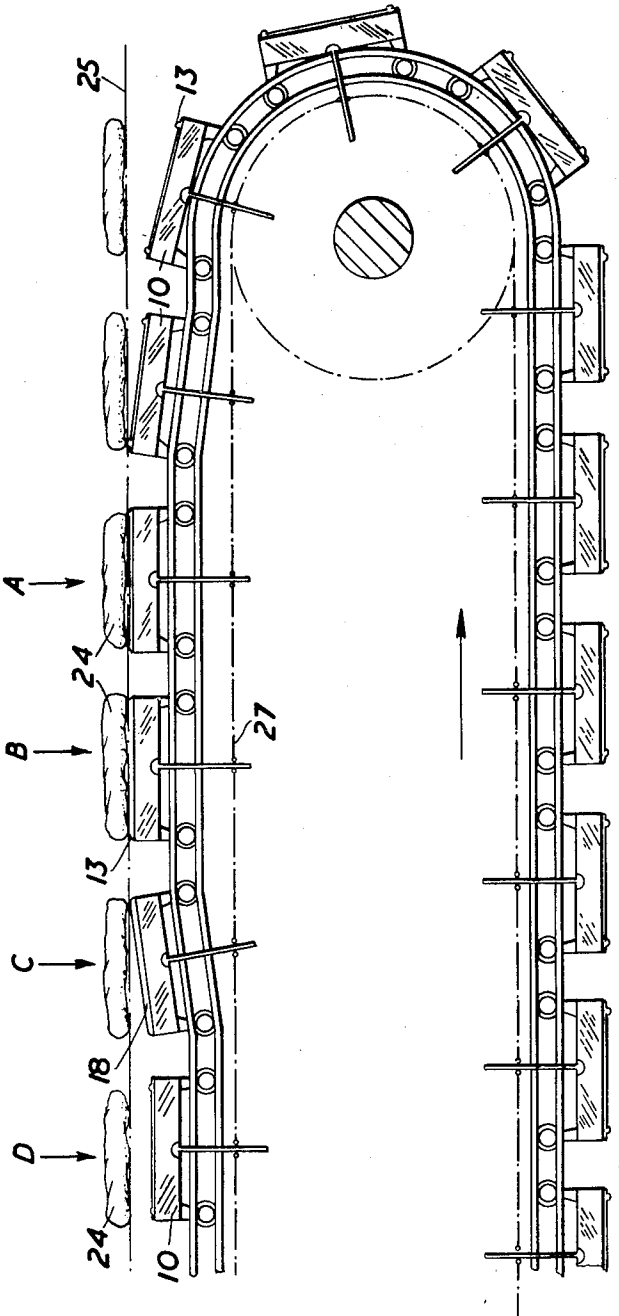


FIG. 9.

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United States Patent Office 3,227,597
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3,227,597

WRAPPING MACHINERY

Peter Gordon Wilson, Leeds, England, assignor to The Fergrove Machinery Company Limited, Yorkshire, England, a British company

Filed Oct. 1, 1963, Ser. No. 312,967
Claims priority, application Great Britain, Oct. 2, 1962, 37,372/62
4 Claims. (Cl. 156—583)

It is common practice in the packaging industry to wrap articles in heat sealable wrapping material and to seal the wrapper by application of heat and pressure to its overlapping folds. The pressure is normally applied by a hot, rigid, sealing member but difficulty is then experienced when the wrapped article has uneven surfaces, as for example in the case of a loaf of bread or a carton having a dished base. The folds are then subjected to uneven pressure and bad sealing is experienced. This difficulty is particularly pronounced when the wrapping material lacks rigidity.

The present invention provides, for the purpose of overcoming this difficulty, a sealing member comprising a rigid block, means for heating the block, a sheet of flexible material attached to a surface of the block and means for forcing air under pressure into the space between the sheet and the block and for exhausting air from this space.

In use, the flexible sheet, which may conveniently consist of glass fibre impregnated with silicone rubber, is first pulled down on to the heated block by suction. As the result the sheet is rapidly heated to the temperature of the block. Air is then pumped under the sheet which lifts from the block and presses onto the folds which are to be sealed, the heat stored by the sheet being sufficient to accomplish this. The air cushion behind the sheet ensures that it conforms to the shape of the folds and the surface of the article behind them, thus achieving a uniform pressure on the folds and hence rendering the sealing uniform. After the seal is made the sheet is again drawn down on to the block for reheating.

The invention will now be further explained with reference to the accompanying drawings, in which:

FIG. 1 is a longitudinal section through a sealing member according to the invention showing the air cushion deflated,

FIG. 2 is a similar view showing the air cushion inflated,

FIG. 3 is a section on the line III—III in FIG. 1,

FIG. 4 is a section on the line IV—IV in FIG. 2,

FIGS. 5–8 are diagrams showing one mode of use of the sealing member and

FIG. 9 is a diagram showing an alternative mode of use.

Referring first to FIGS. 1–4, the sealing member 10 consists of a metal block 11, containing an electrical cartridge type heater 12 and having a flexible sheet 13, of glass fibre impregnated with silicone rubber, attached to its upper surface by side plates 14, attached to the block by screws 15, and end plates 16 attached to the block by screws 17. The space 18 between the sheet 13 and the block is connected by a duct 19 in the block and an external pipe 20 to an air cylinder 21 containing a piston 22 connected to a rod 23 which can be actuated by any suitable means to move the piston to the alternative positions shown in FIGS. 1 and 2. When the piston is moved down to the position of FIG. 2, air is forced into the space 18 to inflate the sheet 13. When the piston is moved up

to the position of FIG. 1 air is exhausted from the space 18 to deflate the sheet 13.

FIGS. 5–8 show diagrammatically how the sealing member 10 may be used to seal packages 24, traversed past it by an intermittently moving conveyor 25. The sealing member 10 is supported on a rod 26 which can be reciprocated to move the sealing member towards and away from the packages. FIG. 5 shows the sealing member approaching the conveyor with the sheet 13 deflated. When the package 24 comes to rest the sealing member has nearly reached it, as shown in FIG. 6, with the sheet 13 still deflated. The sheet 13 is then inflated, as shown in FIG. 7, to make the heat seal. The sealing member is then withdrawn as shown in FIG. 8, and the sealed package is moved on. The sheet 13 is again deflated prior to the next stroke of the sealing member, towards the package.

As an alternative, and when the irregularity in the surface of the package is small, the sealing member may remain stationary in the position shown in FIGS. 6 and 7. The sheet 13 being inflated after the package has moved into position adjacent to the sealing member and deflated again before the sealed package is moved on.

FIG. 9 shows an arrangement in which a number of sealing members 10 are traversed in succession by a chain conveyor 27 into position to seal packages 24 which are fed forward by a continuously travelling conveyor 25. The speeds of the conveyors 25 and 27 are matched and each sealing member approaches and contacts the ends of faces of a package with its sheet 13 deflated as indicated at A. The sheet is then inflated to make the heat seal as indicated at B. The sealing member leaves the package with the sheet inflated as shown at C and afterwards the sheet is deflated as shown at D.

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

1. A heat sealing member, for use in heat sealing packages wrapped in heat sealable wrapping material, comprising a rigid block, means for heating the block, a sheet of flexible material attached to a surface of the block and means for forcing air under pressure into the space between the sheet and the block and for exhausting air from this space.

2. A sealing member as claimed in claim 1, in which the sheet is of glass fibre impregnated with synthetic rubber.

3. A sealing member as claimed in claim 1, in which the space beneath the sheet is connected by a duct in the block and an external pipe to an air cylinder containing a piston which, when moved in the cylinder, forces air into the space or evacuates air from the space according to its direction of movement.

4. A sealing member as claimed in claim 1, in which the block is of metal and contains an internal electrical heater.

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