July 9, 1935. F. J. LEMIEUX 2,007,301

MEANS FOR MAKING SPACERS, RULES OR THE LIKE

Filed April 26, 1933

Fig. 1.

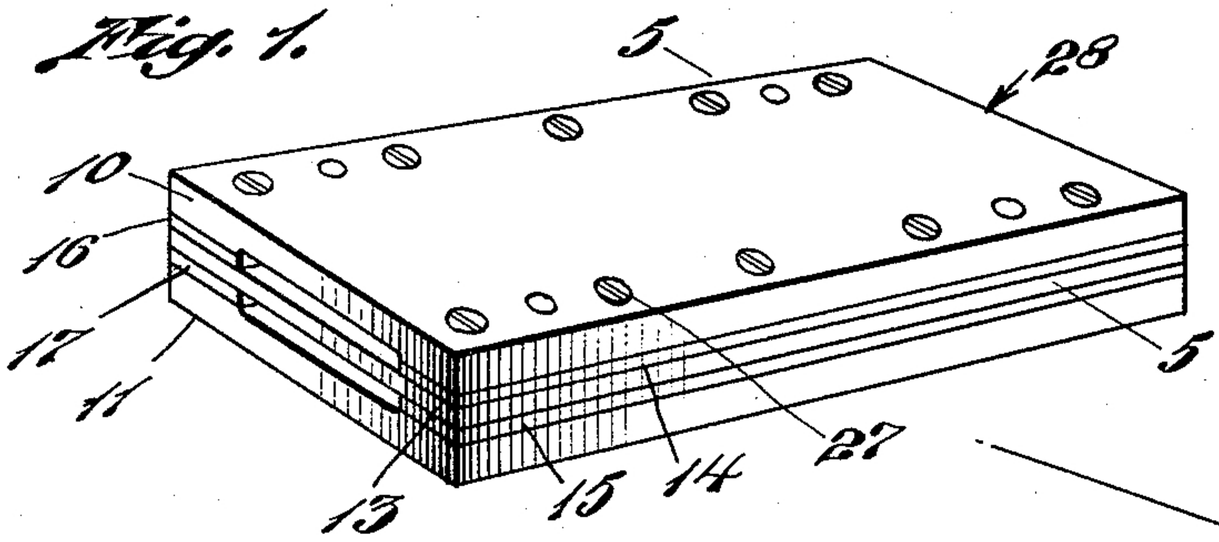


Fig. 2.

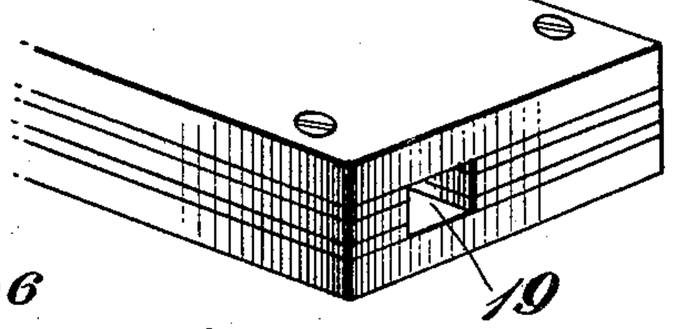


Fig. 3.

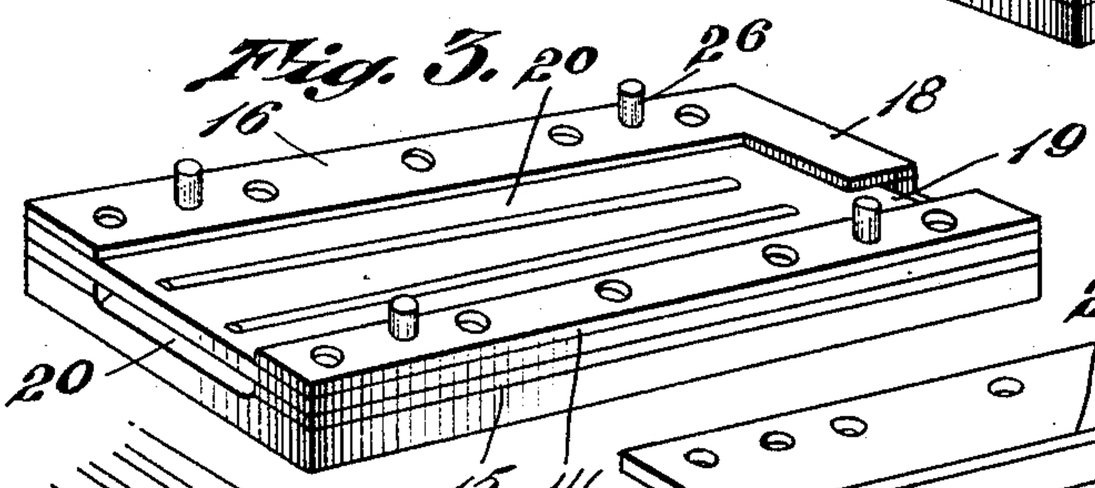


Fig. 4.

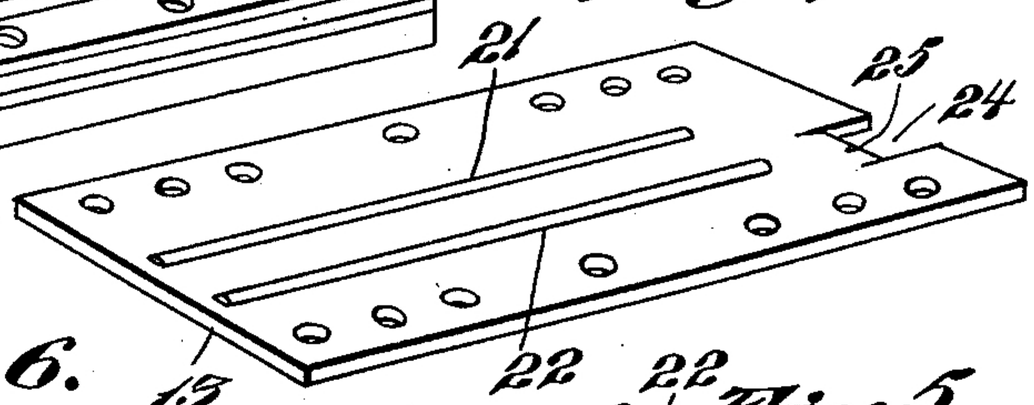


Fig. 6.

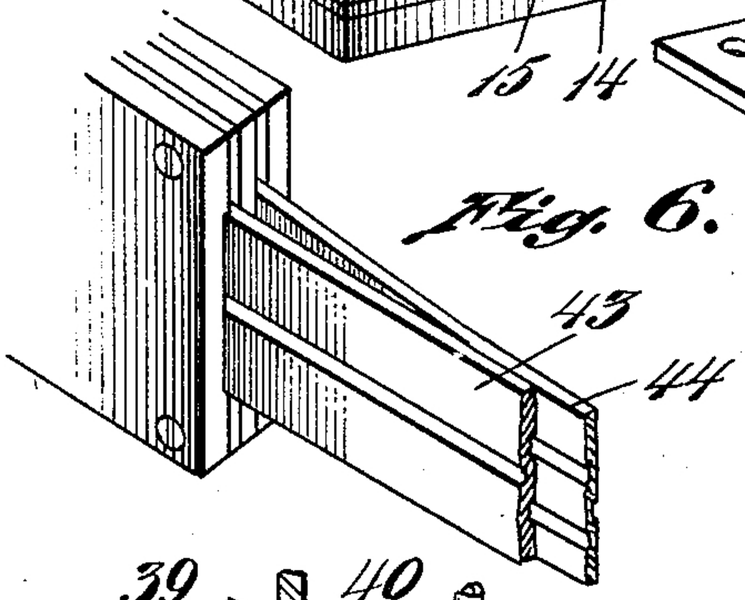


Fig. 5.

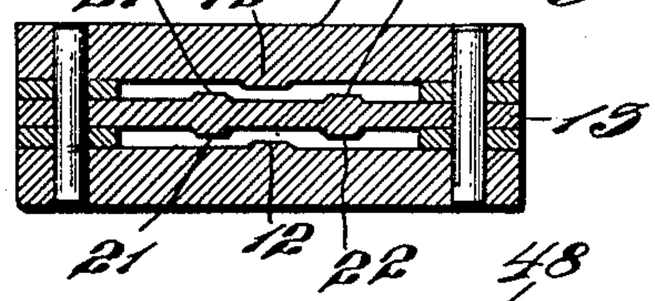


Fig. 8.

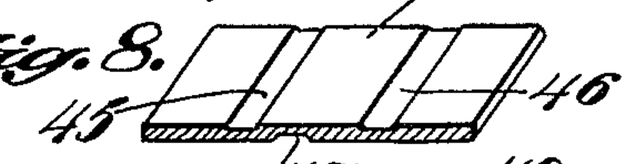


Fig. 9.

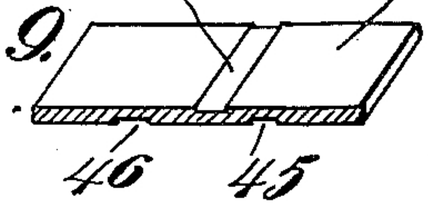
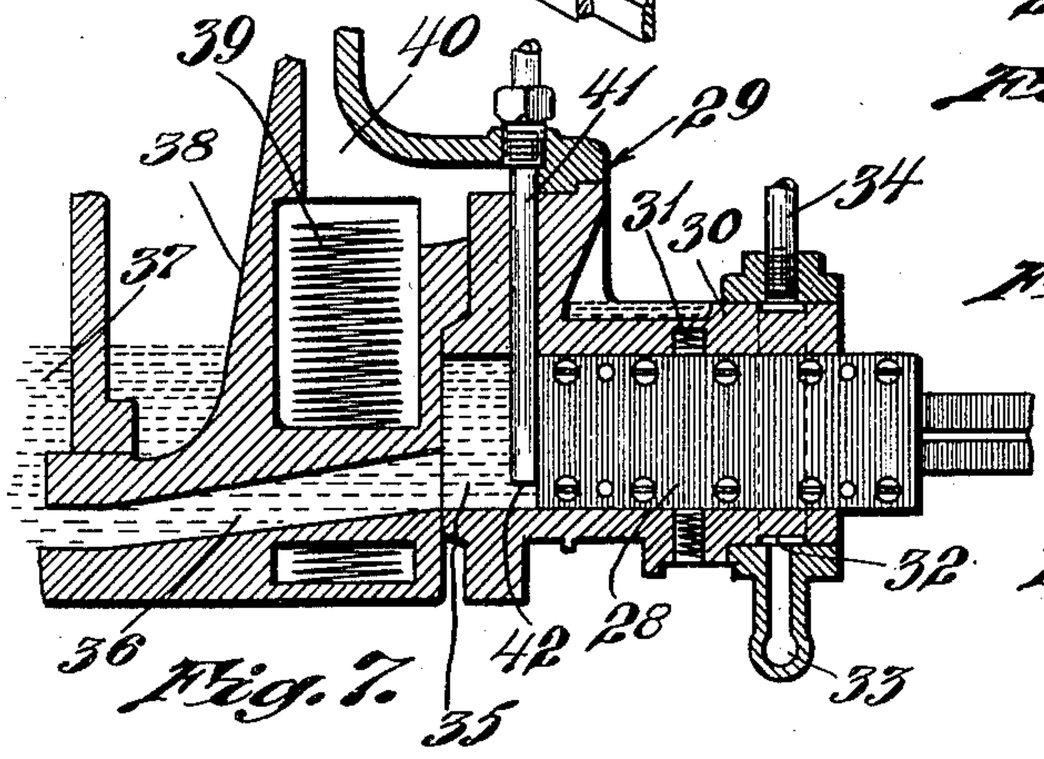


Fig. 7.



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MEANS FOR MAKING SPACERS, RULES, OR THE LIKE

Frank J. Lemieux, Central Falls, R. I.

Application April 26, 1933, Serial No. 667,979

8 Claims. (Cl. 207—17)

This invention relates to a slug, spacer, rule or the like for use in connection with printing and has for one of its objects to provide a product which may be formed so that it will be easily separable from like strips of the product.

Another object of the invention is to better lubricate the work and the mold or die in which the same will be formed by better distribution of the lubricant over the engaging surfaces of the die.

Another object of the invention is the provision of a mold or die for casting or extruding a plurality of ribbons or slugs, by which the separating plate between two of the channels will be kept at a lower temperature.

Another object of the invention is the provision of a division plate between two adjacent channels in a mold or die which will be stiffened against buckling or the like.

Another object of the invention is the utilization of ribs on the division plate between two adjacent channels for distributing the lubricant used over the plate and preventing a quick rise of the lubricant from the lower entering edge of the channel to the upper edge thereof and by this more even distribution to prevent the forming of pockets of oil at the upper edge of the channel and consequently an imperfect edge of the work.

Another object of the invention is the more even distribution of lubrication over the surface of the cast or extruded work so that there is no accumulation of lubricant on the work for the collection of lint or sawdust which frequently occurs in cutting a plurality of the strips for use.

Another object of the invention is the forming of grooves in the work that should there be any excess oil or lubricant used in the formation of the work it will collect in these grooves at which point any lint or sawdust will also collect and be less detrimental by not being forced into the contacting surface of the work when the same is in use.

Another object of the invention is the longer life of the mold and surfaces thereof by reason of the better lubrication of these surfaces and the consequent reduction of wear thereon.

Another object of the invention is the provision of work having a smoother and better surface by forming harder and higher polished surfaces on the mold such as by the use of chromium plating or the like.

A further object of the invention is the speeding up of the operation of the machine in which the mold is used by reason of the quicker cooling of the product and faster drawing through the machine.

With these and other objects in view, the invention consists of certain novel features of construction, as will be more fully described, and particularly pointed out in the appended claims.

In the accompanying drawing:

Fig. 1 is a perspective view showing the discharge end of the mold or die used in the formation of my product.

Fig. 2 is a perspective view showing the entrance end of the mold.

Fig. 3 is a perspective view showing one of the outer plates of the mold removed and exposing the division plate with the ribs thereon.

Fig. 4 is a perspective view of this division plate.

Fig. 5 is a sectional view on line 5—5 of Fig. 1.

Fig. 6 is a perspective view of the discharge end of the mold or die and illustrating a pair of ribbons of the work as extending therefrom.

Fig. 7 is a sectional view of a fragmental portion of the casting machine showing the die or mold in its relative position therein and omitting the remainder of the melting pot and the pulling apparatus for assisting in feeding these ribbons through the machine.

Fig. 8 is a perspective view of a fragmental portion of one of the strips showing the surface contacting with the inner wall of the die.

Fig. 9 is a perspective view of the same strip looking at the opposite side thereof.

This invention has to do more particularly with dies or molds such as are used with a machine known on the market as the Elrod slug and rule caster, and while it is applicable to dies for casting or extruding a single strip or ribbon from molten metal it finds its greatest adaptation and advantages in use where twin, or a plurality of, strips are formed, as in this use certain difficulties are additionally present which this invention obviates.

In the casting of a ribbon having flat opposite surfaces for contacting with type, rules, other spacers or the like it is found that when a plurality of these ribbons are stacked together the film of oil which occurs thereon as they are delivered from the casting machine causes adhesion of these ribbons or strips so that they will stick together and this is particularly noticeable in the ribbons of a thin construction such as two-point thickness, so that it is sometimes difficult for a type setter to separate these spacers, slugs or rules one from the other, thus requiring a slowing up of the type setting operation. Also when

these ribbons are sawed apart and a dust or fine lint or particles of the strips themselves are formed, it frequently occurs that this lint will fly and adhere to the surface of one of the strips, and when this strip is contacted with another strip this particle will be imbedded therein and thus firmly secured thereto, and when the spacer, or if it be a rule, is inserted in place in the setting of type it will cause this spacer to be offline which is undesirable.

Also in the casting of a strip of this character with plain flat surfaces, if too little oil is delivered to the mold, the strip is liable to break in being fed from the die, while if too great amount of oil is delivered, globules of oil will form along the top of the mold and an imperfect upper edge of the ribbon will be formed as it is withdrawn from the machine. Also by reason of the rise of the oil an excess supply of oil is necessary in order that enough be present at the bottom edge and that the bottom be properly lubricated. In the casting of a plurality of strips, such as in the twin mold, the parts between these molds run very hot and if not properly lubricated they are liable to buckle or bend or become distorted, thus destroying the die or mold until replaced.

I have found by the forming of a rib upon the walls of the channel through which the ribbon is extruded or possibly a plurality of ribs upon the division wall between the two channels where a plurality of strips are cast, I am able to minimize, and in some cases entirely eliminate these undesirable effects which I have just mentioned both in the article formed and in the trouble experienced with the dies forming it, and to also acquire certain additional advantages such as increased speed in operation which will more fully hereinafter appear, and the following is a detailed description of the present embodiment of this invention illustrating the preferred means by which these advantageous results may be accomplished.

With reference to the drawing I have illustrated a die or mold used for the formation of two strips or ribbons of work although it will be understood that this is merely illustrative as a single ribbon may be formed, or more than two may be formed if desired.

The mold or die shown consists of outer plates 10 and 11 and a division plate 13 positioned between the outer plates 10 and 11 and spaced from the outer plates by spacers 14 and 15 along one side and 16 and 17 along the other side of the mold, which latter are of generally L-shape with an arm portion 18 extending partially across the entrance end of the mold to leave a narrow throat portion 19 into which the molten metal is forced. Plate 13 is provided with an unobstructed common opening at the entrance of the mold by means of a notch 24 forming a throat with the edge 25 of the notch bevelled or thinned to assist in diverting the material at either side thereof into the channels 20 and 21 formed between the spacers 14—16 and 15—17, which channels are of a size substantially that of the slug to be formed. Thus the thickness of the ribbon is the thickness of the spacer. For instance, if a two-point slug or ribbon is to be provided, the spacers 14 and 15 will be two points thick so as to provide this space between the outer plates 10 and 11, and the division plate 13. The spacer may be interchanged for different dimension channels as desired.

The spacing plate 13 is provided with a pair of ribs 21 and 22 while the outer plates each have a rib 12 extending longitudinally of the channel 20, but to a point slightly short of the discharge end thereof which ribs serve to stiffen the plate and also to distribute the oil more advantageously as will presently appear.

The plates constructed as above mentioned are aligned by pins such as 26 extending through openings in the plate 13 and entering suitable openings or recesses in the outer plates 10 and 11, while the plates are secured in position by screws 27 to hold the mold or die in assembled relation such as shown in Fig. 1.

The die, designated generally 28, in this assembled relation is positioned in a portion 30 of the machine 29 designed to receive it. This portion 30 is heated by an electric resistance coil 31 and is cooled by circulation of water through the channel 32 about this portion, the water entering as at 33 and being discharged through a conduit 34 extending from the upper wall thereof. This heating and cooling are controlled so that the desired condensation of the molten metal will occur.

The mold 28 is positioned in this portion of the machine by allowing some of the molten metal to harden about the outer surface thereof, and is in a position to communicate with the molten metal designated generally 35 which is forced through a channel 36 from a cylinder 37 in the general pot 38 toward this position by a reciprocating plunger not shown but well known in this type of machine. A suitable heating coil 39 is provided in one portion of the pot while other heating coils are also provided in a well known manner to control the temperature of the molten metal. The pot is packed in asbestos 40 as usual.

A lubricant feed pipe 41 is positioned with its discharge end 42 adjacent the inner end of the mold or die 28, and adjacent the throat portion 19 which is lowermost in the die when positioned in the machine. Lubricant is forced, under pressure, through the conduit 41, which pressure is so regulated that the molten metal will not enter the pipe, cool and clog the same, and yet the pressure will be sufficient to cause just enough lubricant to be discharged to properly lubricate the work without being so excessive as to be wasteful or injure the work. If too much lubricant is provided, it will rise both along the outer surface of the tube 41 and also within the mold to collect in globules along the edge of the spacer 16 and prevent the formation of an even and straight line along this edge such as is desired.

The lubricant tends to rise, being lighter than the molten metal which is lead or a large percentage of lead in an alloyed state, and thus there is a tendency for the top edge of the extruded strips, designated 43 and 44, to be more fully lubricated than the lower edge of these strips, but by the provision of ribs on the contacting surfaces of the mold, these act as baffles to prevent this rise of the lubricant and thus causing a distribution of the oil over the surface of the material being cast and also serve to prevent heating to some extent, and by forming grooves in the work, the same will cool faster than were more metal present. Thus by these ribs, which prevent the quick rise of oil along the surface of the mold, the strips are better lubricated and yet less oil need be used to accomplish this lubrication.

The ribbons are fed forward a certain predetermined amount. It is usual in the non-grooved ribbons to feed these forward about four picas, a pica equaling one-sixth of an inch. It is found,

however, that as the cooling occurs much faster in the casting of strips with a groove therein, because of the lubrication and less metal used, as here illustrated, that these strips should be fed forward five picas or five-sixths of an inch in each step action of the machine which is desirable in that it speeds up the action of the machine and the formation of the strips therein about twenty-five per cent. As the strips feed forward fresh molten metal enters the mold and welds to the solid portion of the strip just formed, and as this occurs the oil or lubricant is fed in and the action just mentioned as to the rising of this oil occurs.

I have also found in the use of this machine that so much less lubricant is required that the strips come from the machine in substantially a bright and dry state and what little oil there is, which adheres will collect in the grooves formed in the work. The two grooves, **45** and **46** formed on the inner surface of the work are necessary by reason of the usually hotter contacting surface of the division plate **13**, although I find that by forming ribs of this character the division plate will run much cooler than heretofore and thus there is practically no liability of buckling the same due to excessive heat as sometimes occurs. The outer plate runs much cooler, and but one rib **12** is necessary, thus there is but one groove **47** formed on the outer surface of the ribbon.

These ribbons are used as spacers or rules in printing. They stand on edge in the type setter's tray and contact along the surfaces **48** and **49**, in which the grooves occur, with type or other settings in the type setter's tray. It is usual that these strips will be delivered from the machine in lengths of about thirty inches and the type setter will saw these strips up by groups of a half dozen or more into the lengths required.

In the sawing operation the particles of sawdust, or so-called lint, fly about and frequently contact with one or the other of the engaging surfaces **48** and **49**, and it is found that these particles will imbed themselves into these surfaces and protrude slightly therefrom, which action readily occurs because of the soft character of the metal such as lead or lead alloy used, and thus these particles cannot be easily wiped from position when used by the type setter, and these projections will cause the spacer or rule to be off line to such an extent as to make an imperfect job of setting type. However, by the provision of the grooves in my product and the accumulation of any existing oil in these grooves, these particles will accumulate only in the grooves and will not be forced into the engaging surfaces and thus will not contact with the type and cause an imperfect setting of the type by reason of the imperfect contacting surface of the rule, spacer, or the like.

The grooves in the product also provide a lighter weight product without weakening the same to any material extent and by the distribution of the oil or lubricant the contacting surfaces of the mold will wear a greater length of time. I have found, however, that by coating these contacting surfaces of the mold with a plating of chromium that a harder surface may be provided and one which may receive a higher polish which is reflected in the product in that it is smoother as it comes from the mold than when the surface is not of such a highly polished and smooth character, and further and more important this plating serves to increase the life of the mold.

The foregoing description is directed solely towards the construction illustrated, but I desire it to be understood that I reserve the privilege of resorting to all the mechanical changes to which the device is susceptible, the invention being defined and limited only by the terms of the appended claims.

I claim:

1. In a machine for forming a spacer, rule or the like for printing purposes, a die comprising a channel through which the material is extruded, means for feeding lubricant to said channel, and means on the wall of said channel protruding into the channel for cooperating with the material extruded for effecting the distribution of lubricant.

2. In a machine for forming a spacer, rule or the like for printing purposes a die comprising a channel through which the material is extruded, means for feeding lubricant to said channel, said channel having vertical walls, and a rib on one of the vertical walls extending longitudinally of the channel.

3. In a machine for forming a spacer, rule or the like for printing purposes a die comprising a channel through which the material is extruded, means for feeding lubricant to said channel, said channel having opposite vertical walls, and a rib on both of the vertical walls extending longitudinally of the channel.

4. In a machine for forming a spacer, rule or the like for printing purposes, a die comprising a plurality of channels through which the material is extruded there being a common wall between two of said channels, means for feeding lubricant to said channels, and means on the common wall between said channels protruding into the channels for cooperating with the material extruded for effecting the distribution of lubricant.

5. In a machine for forming a spacer, rule or the like for printing purposes a die comprising a plurality of channels having vertical walls through which the material is extruded one wall being common to two channels, each channel being provided with ribs on said vertical walls extending longitudinally of said channels.

6. In a machine for forming a spacer, rule or the like for printing purposes a die comprising a plurality of channels through which the material is extruded, means for feeding lubricant to said channels, a common wall dividing two of said channels, ribs on the opposite surfaces of said common wall extending longitudinally of said channels for effecting distribution of lubricant thereover.

7. In a machine for forming a spacer, rule or the like for printing purposes a die comprising a plurality of channels through which the material is extruded, means for feeding lubricant to said channels, a common wall dividing two of said channels, a plurality of ribs on each of the opposite surfaces of said common wall extending longitudinally of said channel whereby said wall is stiffened and the lubricant distributed and the wall maintained cooler in operation.

8. In a machine for forming a spacer, rule or the like for printing purposes a die comprising a plurality of channels through which the material is extruded, means for feeding lubricant to said channels, a common wall dividing two of said channels, a plurality of ribs on each of the opposite surfaces of said common wall extending longitudinally of said channel and a single rib on the opposite wall of said channel for effecting distribution of lubricant thereover.

FRANK J. LEMIEUX.