Nov. 16, 1948. G. A. HIESTER 2,454,170

STEREOTYPE CYLINDER PRINTING PLATE

Filed Feb. 23, 1942 2 Sheets-Sheet 1

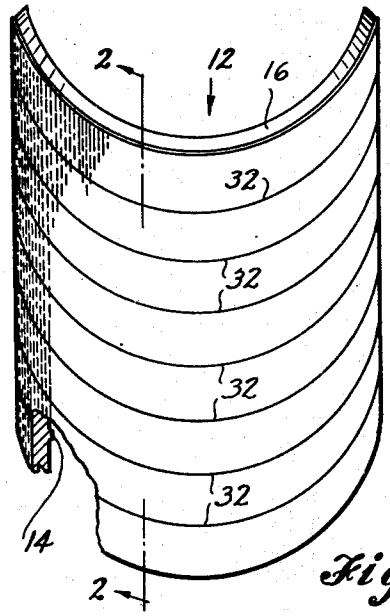


Fig. 1

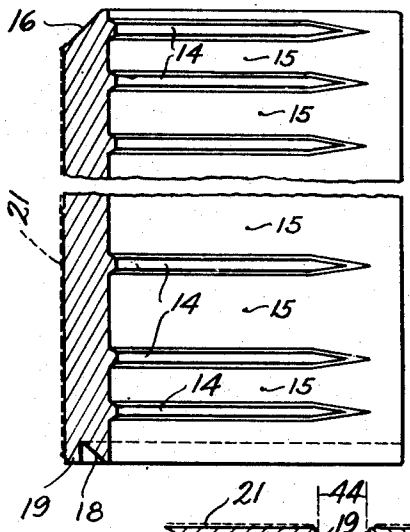


Fig. 2

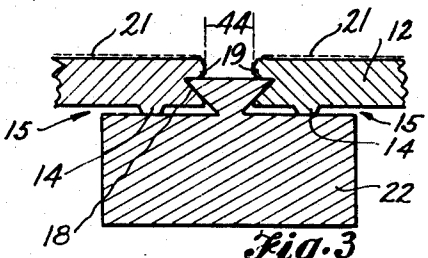


Fig. 3

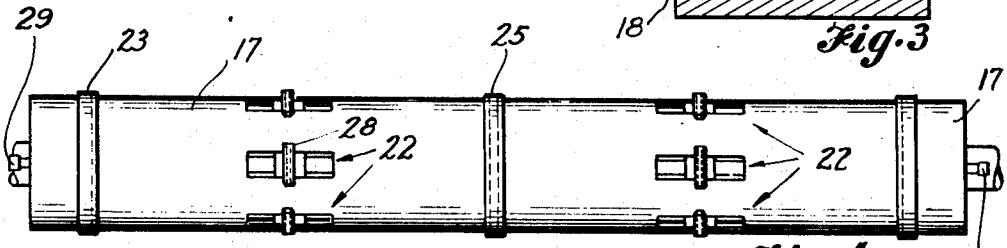


Fig. 4

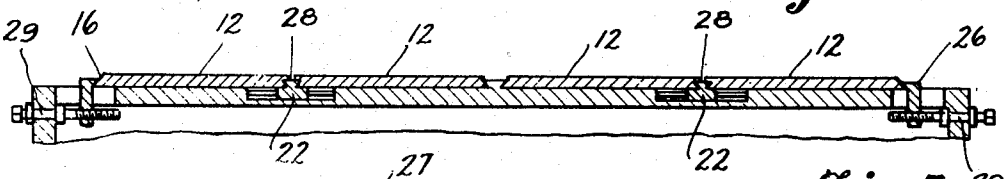


Fig. 5

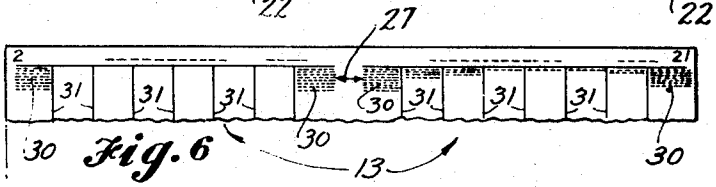


Fig. 6

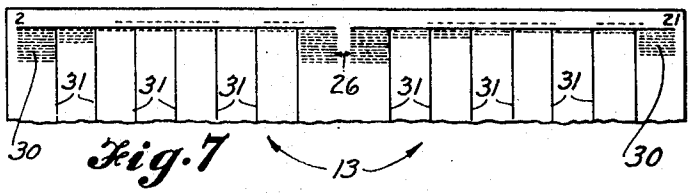


Fig. 7

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STEREOTYPE CYLINDER PRINTING PLATE

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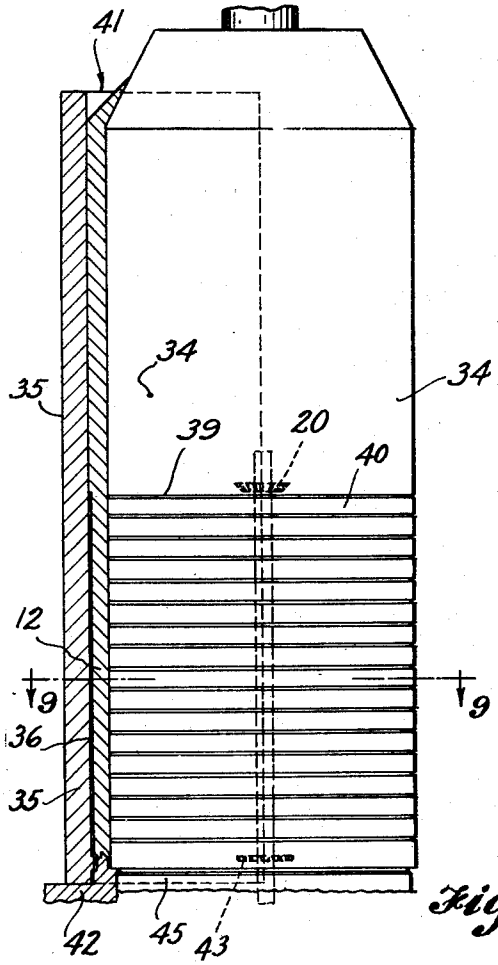


Fig. 8

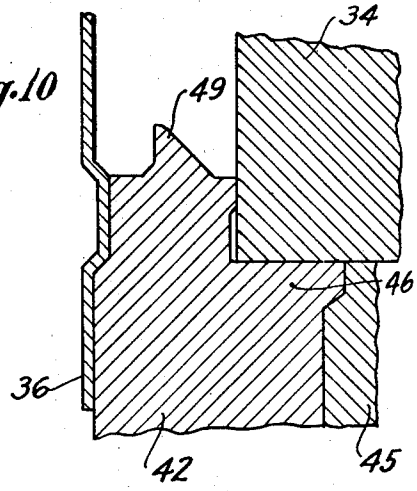


Fig. 10

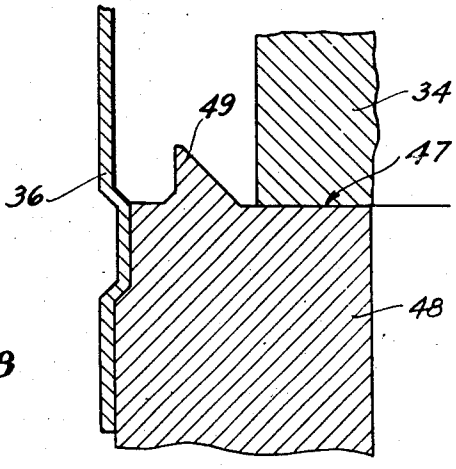


Fig. 11

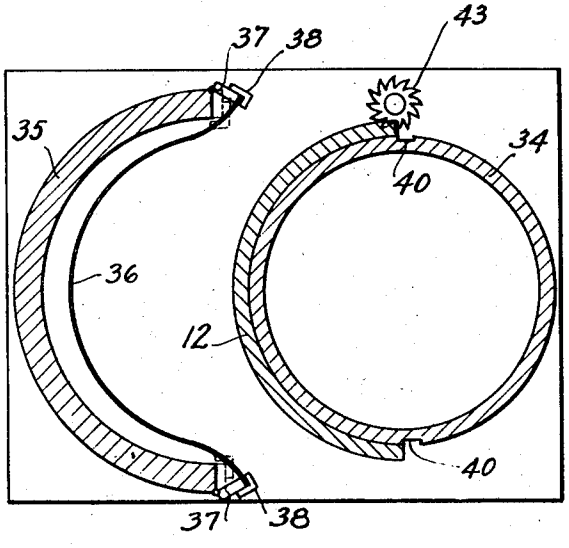


Fig. 9

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STEREOTYPE CYLINDER PRINTING PLATE

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Application February 23, 1942, Serial No. 431,942

3 Claims. (Cl. 101—378)

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This invention relates to newspaper printing, and more particularly, the invention relates to the reduction of the blank space for the fold in the middle of a double newspaper sheet, such reduction provides for the reduction of the over-all width of the double sheet and thereby the reduction in the printing paper tonnage.

A primary object of my invention is to produce a saving in the amount of paper employed to the extent of many tons in the course of a year so that a saving, for a newspaper of even moderate size circulation, is made amounting to several thousand dollars. The amount of the saving will be proportionate to the size of the paper and the circulation.

The invention requires the following of a certain procedure beginning with the casting of the stereotype plates and includes a change in the stereotype plate casting machine as respects the segment ring thereof. Otherwise, the standard newspaper printing equipment is employed including the matrix, the casting machine, and the printing press. It will be understood that the standard printing equipment for a newspaper is very expensive and it is one of the objects of my invention to make the saving herein set forth with a relatively inexpensive single change in the equipment, namely the said change in the segment ring of the casting machine.

Stereotype metal is subject to becoming very porous when cast and the strength of the metal is ever subject to question on account of this great porosity. Accordingly, the clamping means of the printing plates to the press cylinders (generally referred to in the art as "lock-up" of the plates of the standard printing presses) are caused to extend over substantially all of the length of an inclined edge portion of the plate. In view of the fact that the centrifugal force developed by the rotation of the printing press cylinders is of such great magnitude, and in view of the possible damage to the printing press and the many complications incident to delay in issuing editions of the newspaper which would follow any failure of the plates to remain in clamped position, it has been deemed advisable to cast the clamping edge of the printing plates with a substantial length of inclined clamping face. It has been thought necessary to distribute the clamping pressure over as large a portion of the cast metal as possible in order to avoid a failure of the metal at the location of clamping. After extended experimentation, I have discovered that the lower portion of a stereotype plate is sufficiently strong and nonporous to permit the casting thereon of a reduced clamping surface and an overhanging unsupported printing surface thereover, which clamping surface, though it is reduced, yet I have discovered is sufficiently strong to be relied upon to hold the plate against the heavy stresses developed by the printing press.

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Also it is a part of my discovery that the printing portion may be allowed to overhang the reduced inclined clamping face with only relatively simple inexpensive alteration in the standard casting equipment.

In this connection it is an object of my invention to provide a stereotype plate casting machine with a segment ring at the lower portion thereof and with said ring having a rib substantially medially projecting upward into the casting area. Such ring may be utilized with the minor change of the filling of one of the lower grooves in the core of standard casting stereotype machines and the result is the great saving amounting to tons of printing paper in the course of a year in the case of a newspaper of moderate circulation.

The above mentioned general objects of my invention, together with others inherent in the same, are attained by the mechanism and process illustrated in the following drawings, the same being preferred exemplary forms of embodiment of my invention, throughout which drawings like reference numerals indicate like parts:

Figure 1 is a fragmentary view in perspective of a stereotype plate embodying my invention;

Fig. 2 is a view in section, on a larger scale and with parts broken away, on broken line 2—2 of Fig. 1;

Fig. 3 is a detached view in section of a retaining clip of a printing press engaging the adjacent edge portions of fragments of two stereotype plates, which edge portions embody my invention;

Fig. 4 is a view of a four page printing press cylinder illustrating the lock up bands, clips and center band;

Fig. 5 is a fragmentary longitudinal sectional view of parts shown in Fig. 4;

Fig. 6 is a view in elevation of the top portion of a double page printed sheet providing pages, as 2 and 21, showing the relatively wide middle space between the adjoining printed portions of the two pages, as commonly obtains in newspapers as heretofore printed;

Fig. 7 is a view in elevation of the top portion of a double page printed sheet providing pages, as 2 and 21, showing the relatively narrow middle space between the adjoining printed portions of two pages, as obtains when my invention is employed, as well as the narrower sheet, and yet

with the printed material of the page undiminished;

Fig. 8 is a longitudinal sectional view through a stereotype plate casting machine showing the device closed and with my segment ring in place and with the device filled with stereotype metal;

Fig. 9 is a view in section on broken line 8—8 of Fig. 8 and showing the device in open position;

Fig. 10 is an enlarged fragmentary view of the bottom portion of the casting chamber showing the relation of the upper portion of the segment ring of my invention to the matrix and core or cylinder of a stereotype plate casting machine; and

Fig. 11 is a view similar to Fig. 10 of a modified form of my invention.

Referring to Fig. 1 of the drawings, the stereotype printing plate 12 embodying this invention is shown. It is common practice to provide stereotype printing plates for use on newspapers in half cylinders and two of such half cylinder printing plates 12 are secured to the printing cylinder, as printing cylinder 17 (Fig. 4) to completely cover one section of a printing cylinder. Further, it is common practice to longitudinally dispose four plates on a cylinder, so far as the length thereof is concerned. This means that there will be eight plates 12 secured to the printing cylinder 17. Each printing plate 12 will print a single newspaper page 13, as page 2 or 21 of Figs. 6 or 7.

Referring to the completed plates 12 of this invention, the same are preferably cast with bearing ribs 14 on the back thereof, leaving valleys 15 therebetween. At one end portion of the plates 12 is provided the clamping face or portion 16. This face or portion 16 is provided by sawing or trimming, as hereinafter explained, by tool 20 (see Fig. 3). It will be noted that this edge portion or face 16 extends all the way from the printing face or type portion 21 of the plates 12 (see Fig. 2) to the back of the plates. The edge portions 16 of each plate 12 are secured to the cylinder 17 by the center band 25 or the lock-up bands 23. The incline or angle of the face 16 to the longitudinal axis of the plates 12 and the corresponding and interfitting clamping face of the lock-up bands 23 and the center band 25 are commonly forty-five degrees, although some presses employ other angles, as sixty degrees.

On the other end of the plates 12 is provided a clamping edge or face 18 which is provided by casting and is preferably forty-five degrees to the longitudinal axis of the printing plates 12. This portion 18 is only substantially half of the depth of the clamping face 16 and may be such by reason of the density of the metal or nonporous character of the metal at this location, as is hereinafter explained. Further, the upper edge of the face 18 as shown in Fig. 3 is preferably medial of the plates 12. Overhanging the clamping face 18 is a projection 19 and on which is located a portion of the printing surfaces or type 21. As a printing surface is provided on the overhanging projection 19, the extent of the center space between pages 13, (see Fig. 7) may be limited as desired. From an examination of Figs. 6 and 7 it is apparent that the center space 26 obtaining by the use of my invention is substantially reduced over the center space 27, which obtains in newspapers following the prior art practices.

The above described plates 12 which are made in accordance with my invention and in a manner hereinafter set forth, are attached to a standard printing cylinder 17 by the usual lock-up devices. The center band 25 in standard practice is secured to the cylinder 17. The clips 22 are moved respectively away from the center band 25. Then the plates 12 are placed on the cylinder 17 with the clamping faces 16 under the matching clamping surfaces of the center band 25. Then the plate engaging portions 28 of the lock-up clips 22 are moved toward the center band 25 and then additional plates 12 are placed on the printing cylinder 17 and with the portions 18—19 adjacent the lock-up clips 22. This leaves portions 16 of plates 12 on the outer ends of the printing cylinder 17 and then the lock-up bands 23 are moved toward the center band 25. As illustrative of mechanism for moving the lock-up bands 23 and securing the same in a desired position, I have illustrated screws 29 which are held against longitudinal movement in the cylinder 17 and which are interthreaded with the lock-up bands 23. By rotation of the screws 29 in one direction, the lock-up bands 23 will move longitudinally and in a direction away from the center band and upon rotation of the screws 29 in the other direction the lock-up bands 23 will move toward the center band 25. Any conventional manner of moving and locking the lock-up bands 23 may be employed.

The type or printing surface 21 of the plates 12 is shown somewhat diagrammatically in Figs. 1, 2 and 3 and the resultant printing 30 is also somewhat diagrammatically shown as in Figs. 6 and 7. Also the printing surface or type 32 for printing the column lines 31 (see Figure 1 and Figs. 6–7) are similarly somewhat diagrammatically shown as they are conventional in form.

The diameter of the printing cylinder 17 is such that a plate 12 will print a single page 13 of a newspaper. In order to provide the desired vertical spaced relation between two pages, the commonly employed stagger bars (not shown) may be used.

In Figs. 1 to 7 inclusive I have illustrated the printing plates 12 of my invention. In Figs. 8 to 11 inclusive, I have shown apparatus whereby the results of this invention may be accomplished. It has been suggested in the prior art that a clamping face, such as clamping face 18, having an over-hanging projection 19 with type thereon, may be employed. However, no practical way of providing such a construction for newspaper work has been heretofore available. The prior commercial art suggested the use of milling mechanism to provide such an end construction for a printing plate. Such suggestion found little practical application in view of the fact that in newspaper work, stereotype printing plates must be produced at a speed of approximately twenty seconds for each printing plate. I have gone contrary to the suggestions of the prior art which attempted to provide by milling a partial incline, as 18, and an overhanging projection 19 having a printing surface thereon, and have practically solved the problem by casting in a particular manner.

Referring to Figs. 8 and 9 the stereotype plate casting machine embodies a core member 34 which is provided with an internally positioned cooling apparatus (not shown). Also the core member 34 as commonly used is provided with means to rotate the same (not shown). The back 35 is mounted for movement toward and away from the core member 34 and is shown in fully open position in Fig. 9 and is shown in fully closed position in Fig. 8. Also the back 35

is provided with internal cooling means (not shown) all in accordance with common practice.

A matrix 36 is first secured to the back 35. The end portions of the matrix 36 are secured between lugs 37 and clamps 38. The matrix 36 assumes initially a position as shown in Fig. 9 and also assumes such position after the making of the plates 12. As the back 35 and the matrix 36 are moved toward the core member 34, the lugs 37 and clamps 38 rotate and move from the full line position shown in Fig. 9 to the dotted line position shown in Fig. 9 and with the end portions of the clamps 38 positioned in the recesses 40 in the core member 34. The back 35 thus provides a retractable matrix mounting outer wall.

Referring more particularly to Fig. 8, the core 34 is provided with depressions 39 and raised portions 40 which will form in the plates 12 the ribs 14 and valleys 15, respectively. After the back 35 has been moved relative to the core member 34 to provide the position shown in Fig. 8, then stereotype metal is pumped into opening 41. The stereotype metal will fill the space between the matrix 36, the core member 34, the back 35 and the segment ring 42 and the level of the stereotype metal is to the level indicated in said Fig. 8. Due to the stereotype metal and the nature of the conditions of casting, there is a tendency of the metal to solidify with numerous air holes therein. It has been found that it is desirable to make a casting substantially twice as long as the casting which is to be used and cut off the top portion thereof, known in the trade as the tail of the stereotype plates, by a cutter, such as the cutter 20. This cutter 20 is of a shape and design to cut the desired angular relation to the clamping face or edge portion 16. Thus, during the casting and cooling period (approximately twenty seconds) there is present the entire weight of the metal so that the portion of the casting of greatest porosity is removed by the cutter 20 and is not a part of the completed plate. However, there is such porosity present in the upper portion of the plate 12 as the same is viewed in Figure 1 of the drawings, so that the clamping face 18 and overhanging projection 19 may not be successfully or practically cut at the upper end portion of the plate 12. On the other hand, by providing a segment ring 42 at the bottom of the casting chamber, I am able to provide in a sufficiently non-porous portion of the plate 12, a clamping face 18 of sufficient strength to eliminate any possibility of a plate 12 from becoming detached from a cylinder 17 during normal operation.

The core member 34 is mounted for rotary movement so that after the casting of the plate 12, the back 35 may be moved to the position shown in Fig. 9 and then the core member 34 rotated. Upon rotation, the plate 12 will be passed through rotating saws 20 and 43 and the saw 20 will form the edge or clamping face 16 of the plate 12, and the saw 43 will true up the edges of the plate 12 along dotted lines 44 shown in Fig. 3 of the drawings. The purpose of cutter or saw 43 is to remove casting imperfections as hanging threads and the like.

Upon rotation of the core member 34, the base 45 and the segment rings 42 are stationary. At this time, the back 35 has been moved out of the way and into the position shown in Fig. 9. Thus the stereotype plate 12, which has been formed, rotates with the core member 34 and there is relative movement between the plate 12 and the segment ring 42. Thus, in order to permit ready movement between the plate 12 and the segment ring 42, a relatively tight fit between the same is necessary to prevent molten metal from passing between the segment ring 42 and the core member 34 and solidifying at this location.

In the showing in Fig. 8 of the drawings, and in the showing in Fig. 10, which is an enlarged view of the parts under consideration, the segment ring 42 is provided with a portion 46 which fits under the core member 34. The construction thus shown in Figs. 8 and 10 of the drawings permits the core member, as commonly employed, to be used and the direct insertion of my segment ring 42. Preferably the lowermost depression 39 of a standard core member 34 is filled and the depressions 39 are spaced as shown in Fig. 8 of the drawings.

Many times core members, as core member 34 are not positively round so there may be a possibility of molten stereotype metal passing between a segment ring and the core member 34. Thus I have shown in Fig. 11 a modified form of the invention where the core member 34 is cut at the level 47 so that the segment ring 48 will be positioned directly below the core member 34. In each of Figs. 10 and 11 the shape of the projecting portion 49 is such as to permit the casting and forming of the clamping face 18 and the overhanging projection 19 on the completed stereotype plate 12. In practice I have found that the form of my invention shown in either Figs. 10 or 11 may be employed. The advantage of the design shown in Fig. 10 is that my new segment ring may be employed in standard casting machines without any substantial change, but there is a possibility, in the event of worn machines, of metal being disposed in the vertical passageway between my segment ring 42 and the core member 34. On the other hand, if the form of the invention as shown in Fig. 11 is employed, the vertical passageway is eliminated and likewise is eliminated any possibility of metal becoming solidified between my segment ring 42 and the core member 34 which are moved relative to each other during the operation of saws 20 and 43. The only possible disadvantage of the form of the invention shown in Fig. 11 of the drawings, is that a portion of the core member 34, as it is normally made, must be removed so that the segment ring 48 may assume the position shown in Fig. 11 of the drawings.

It is of great importance in this invention to note that the projection 49 on either the segment ring 42 or 48 projects upwardly into the casting chamber and forms the bottom wall of the cast plate 12. Due to the fact that the segment ring is positioned at the bottom of the casting chamber, there is sufficient lack of porosity in the casting so that an inclined clamping face 18 is formed which has sufficient strength to permit the same to be positively held to a printing cylinder 17. Also at the same time, the overhanging portion 19 has sufficient lack of porosity so that it will have sufficient strength to permit printing from a type surface on the overhanging projection 18 and at the same time eliminate any possibility of breakage during normal use of the plate 12. Preferably the projection 49 projects medially of the casting chamber and thus forms a cast stereotype plate having at its dense portion an inwardly and inclined portion as 18 with an overhanging or projecting portion thereover as 19. There has been consideration in the prior practical art of a stereotype plate with an end

portion thereon having a design similar to the face 18 and overhanging projection 19 but no one has heretofore provided a practical way in which such a design may be formed into the stereotype plate for newspaper use. The suggested milling operation to mill such a design into a plate has been tried and found wanting for newspaper work because the same would inherently slow up the forming of stereotype plates and require time outside of the time permitted in practical newspaper operation for the forming of a stereotype plate. Further, it was thought impossible to have the desired design cast in the end portion of a stereotype plate, as it was felt not sufficient strength could be obtained in such a casting. However, I have found that where the said design is cast by reason of a segment ring placed in the bottom of a casting chamber that at such position there is sufficient lack of porosity in the metal so that sufficient strength obtains and plates embodying my invention have gone into practical use and on a large scale.

Thus I have devised a method and apparatus for reducing the over-all width of a newspaper printed sheet having two printed pages thereon by reducing the middle space separating the said printed pages. I have provided a vertically positioned annular chamber having a segment ring positioned at the bottom thereof for forming a stereotype plate having thereon an inclined clamping face and an overhanging printing surface. I desire that the edge of each plate 12 for printing a page of newspaper print shall have the design, comprising the inclined surface 18 and the overhanging projection 19, so positioned so that two plates 12 on a printing cylinder 17 will have such designs adjacent each other. To provide for the desired strength and also to permit a plate of the proper design to be formed by casting, it is necessary that the matrix be placed in the annular casting chamber with the impression on the matrix for forming the outside edge of each page upwardly and the impression on the matrix for forming the opposite edge downwardly. The almost universal practice in the newspaper art is to place the folio or page number on the outside of each page as shown in Figs. 6 and 7. Thus in placing a matrix in a stereotype casting chamber, the matrix will always be placed so that the folio number is upwardly extending. Thus by my process and apparatus, the printed portion on the newspaper pages are maintained at any standard area and the usual space, separating the adjoining pages which is merely used for margins and is folded, is reduced and thereby a substantial saving in paper stock results and at the same time standard printing equipment may be used.

Obviously, changes may be made in the forms, dimensions and arrangement of the parts of my invention, without departing from the principle thereof, the above setting forth only preferred forms of embodiment of my invention.

I claim:

1. A stereotype cylinder printing plate formed in a casting machine having a rotatable casting core and a segment ring having an upstanding rib between said core and the matrix, said plate being characterized by being a rotatable core cast plate and having the edge portion which prints that portion of the news page next the folding space provided with a cast recess in its end wall dividing said edge portion into two parts, first, an inner part having an inclined face serving as a clamping face and second, an outer part constituting a printing part having a printing surface overhanging said inclined face, the recess having a second face parallel to the printing surface, said printing surface and said second face being concentric, the ends of said two parts lying in the same plane at right angles to the cylinder plate axis, the contour and condition of said recessed inclined clamping face being complete at the time the plate is removed from the core.

2. A stereotype cylinder printing plate formed in a casting machine having a rotatable casting core and a segment ring having an upstanding rib between said core and the matrix, said plate being characterized by being a rotatable core cast plate having one edge saw cut and the opposite edge portion which prints that portion of the news page next the folding space provided with a cast recess in its end wall dividing said opposite edge portion into two parts, an inner and outer part, said recess being located between and in spaced relation to the printing face and the core side of the plate, the inner part having an inclined face serving as a clamping face and the outer part constituting a printing part having a printing surface overhanging said inclined face, the recess having a second face parallel to the printing surface, said printing surface and said second face being concentric, the ends of said two parts lying in the same plane at right angles to the cylinder plate axis, the contour and condition of said recessed inclined clamping face being complete at the time the plate is removed from the core.

3. In a printing press having two stereotype plates positioned side by side on a cylinder, each of said plates comprising a stereotype cylinder printing plate formed in a casting machine having a rotatable casting core and a segment ring having an upstanding rib between said core and the matrix, said plate being characterized by being a rotatable core cast plate and having the edge portion which prints that portion of the news page next the folding space provided with a cast recess in its end wall dividing said edge portion into two parts, an inner and outer part, the inner part having an inclined face serving as a clamping face and the outer part constituting a printing part having a printing surface overhanging said inclined face, the recess having a second face parallel to the printing surface, said printing surface and said second face being concentric, the ends of both parts lying in the same plane at right angles to the cylinder plate axis, the contour and condition of said recessed inclined clamping face being complete at the time the plate is removed from the core, said plates being arranged so that their said recessed edge portions are adjacent but spaced apart, and clamping means mounted on the press cylinder and located between said plates and engaging said recessed inclined clamping face of each plate.

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