May 22, 1956 A. J. ALESSI, JR., ET AL 2,746,389

PRINTING ROLLERS AND TYPE THEREFOR

Filed March 2, 1953 2 Sheets-Sheet 1

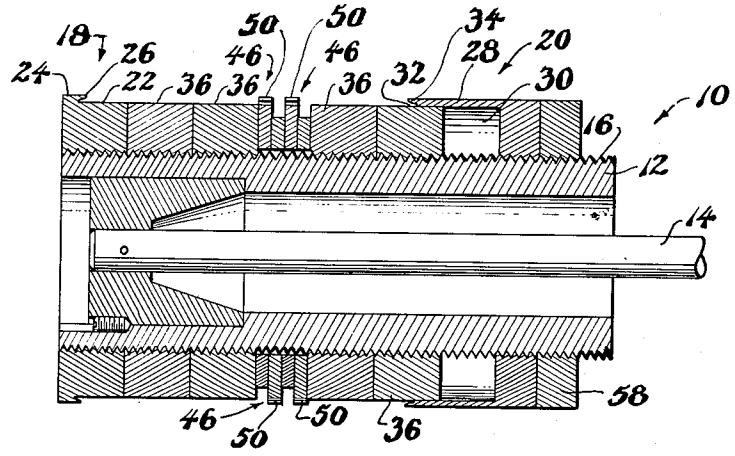


Fig. 2

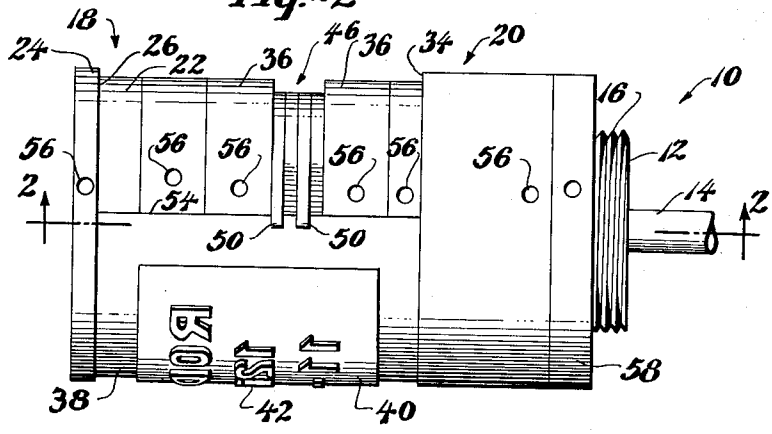


Fig. 1

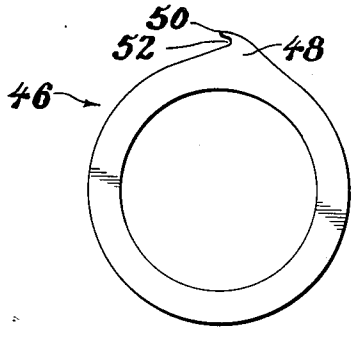


Fig. 3

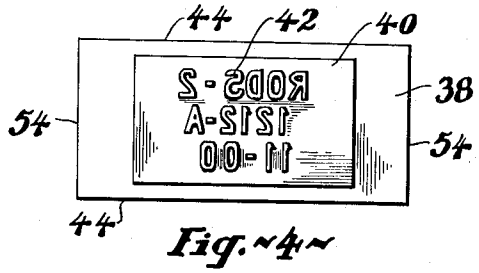


Fig. 4

INVENTORS.
ANDREW J. ALESSI JR., IRA S. GOTTSCHO
AND MALCOLM HIRSCHEY.
BY Jack Montgomery
ATTORNEY.

May 22, 1956 A. J. ALESSI, JR., ET AL 2,746,389

PRINTING ROLLERS AND TYPE THEREFOR

Filed March 2, 1953 2 Sheets-Sheet 2

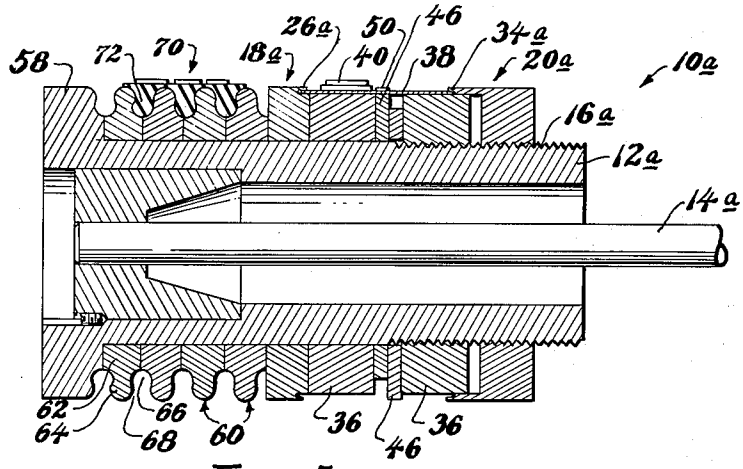


Fig. 5

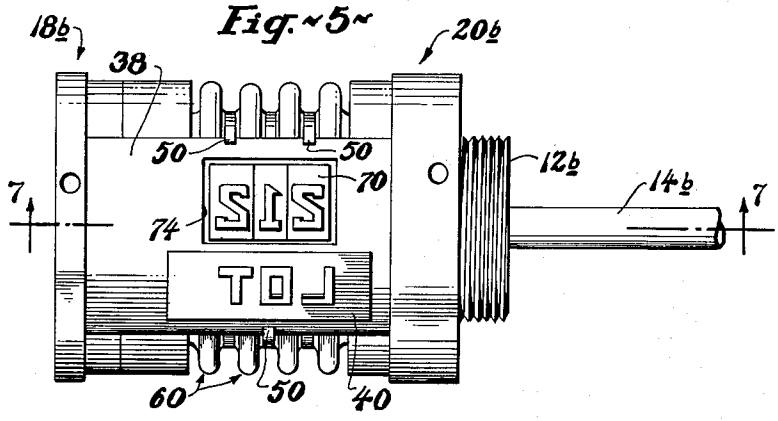


Fig. 6

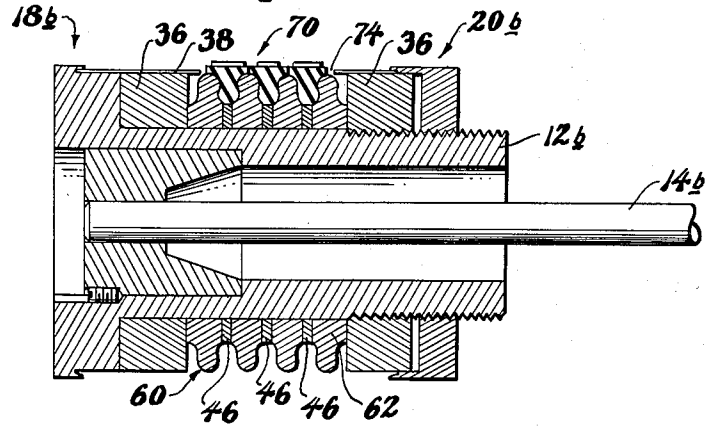


Fig. 7

INVENTORS.
ANDREW J. ALESSI JR., IRA S. GOTTSCHO
AND MALCOLM HIRSCHEY.
BY Dyk Montgomery
ATTORNEY.

United States Patent Office 2,746,389 Patented May 22, 1956

2,746,389

PRINTING ROLLERS AND TYPE THEREFOR

Andrew J. Alessi, Jr., Colonia, and Ira S. Gottscho, Milburn, N. J., and Malcolm Hirschey, Woodside, N. Y., assignors to Adolph Gottscho, Inc., Hillside, N. J., a corporation of New York

Application March 2, 1953, Serial No. 339,582

15 Claims. (Cl. 101—377)

The present invention relates generally to printing rollers and type, and is particularly directed to printing rollers for supporting rubber type and improvements in rubber type for mounting on such rollers.

In the application of Ira S. Gottscho, Serial No. 219,867, now U. S. Patent No. 2,643,609, relating to a "Holder for Rubber Type," structure is disclosed for holding rubber type on the surface of a cylindrical support. Such structure includes a series of axially movable, rigid rings extending around the cylindrical support and adapted, when they are axially compacted together, to compress and grip rubber elements extending from the back of the rubber type between the successive rings and thereby securely hold the rubber type on the support. While the structure disclosed in the above identified application is adequate in certain cases, particularly when the type mounted on the printing cylinder or roller consists of a series of separate and individually removable type elements, it is not well adapted for securing a large logotype, that is, an integral type piece bearing a syllable, a word or a series of words, as it then becomes difficult and expensive to form the integral rubber elements on the back of the type for engagement between the successive gripping rings. Further, when the rubber type extends over a relatively large number of gripping rings, in the structure of the above identified application, and the gripping rings are axially compacted to secure the type on the surface of the printing roller, the end gripping rings are displaced excessively toward each other in the axial direction by the compacting movement and cause distortion of the rubber type.

Accordingly, it is an object of the present invention to provide rubber type and structure for holding such type on the surface of a printing cylinder or roller, wherein the type piece may be in the form of a logotype bearing a syllable, word or series of words and may extend substantially over the length of the printing roller without suffering distortion or buckling when the holding structure is tightened to secure the type on the printing roller.

Another object is to provide rubber type and structure for holding such type on the surface of a printing cylinder or roller arranged so that the same may be used exclusively on the printing roller or in combination with rubber type and holding means of the kind described in the above identified application of Ira S. Gottscho.

Another object is to provide rubber type having a resilient metal backing so that the same type may be secured to the surfaces of printing rollers or cylinders having different diameters and surface curvatures.

A further object is to provide rubber type having a resilient metal backing and structure for securing the type to the surface of a printing cylinder or roller which includes relatively axially movable members gripping the circumferentially extending edges of the resilient backing plate and additional gripping members seizing the opposite axially extending edges of the backing plate to prevent buckling or bowing of the backing plate.

A still further object of the invention is to provide rubber type and means for securing the same on printing rollers or cylinders, wherein the type is adapted to withstand long usage without excessive wear, and the type and securing means can be produced at relatively low cost and assembled together easily without employing special tools or equipment.

In accordance with the present invention, the foregoing, and other objects, features and advantages appearing in the following detailed description, are achieved by providing rubber type having a resilient, normally flat, metal backing plate secured thereto and extending beyond the edges of the rubber type. The printing roller, on which the type is to be secured, includes a cylindrical body having two securing ring members thereon, one of which may be integral with the cylindrical body, with the securing ring members being relatively movable in the axial direction. A plurality of spacing and support ring members are provided on the cylindrical body between the securing ring members, and the resilient backing plate of the type is adapted to rest upon and be supported by the peripheral surfaces of the spacing and support ring members. The securing ring members are formed with annular lips extending axially toward each other from the peripheral edges of the confronting radial faces of the securing ring members and these annular lips have internal diameters slightly greater than the diameter of the peripheral surfaces of the spacing and support ring members to overlie and grip the opposite circumferential edges of the resilient backing plate supported by the spacing and support ring members when the securing ring members are relatively displaced axially toward each other. Finally, at least two hold-down ring members are interspersed among the spacing and support ring members on the cylindrical body, and these hold-down ring members are, for the most part, no greater in diameter than the peripheral surfaces and have localized radially enlarged portions formed with oppositely extending tangential fingers which overlie and hold down the opposite axially extending edges of the resilient backing plate of the rubber type so that the backing plate cannot buckle or bow-out under the compressive forces exerted by the the securing ring members.

In order that the present invention may be fully and easily understood, illustrative embodiments are hereinafter described in detail, merely by way of example, and are shown in the accompanying drawings forming a part hereof and wherein:

Fig. 1 is an elevational view of a printing roller or cylinder having type and securing means therefor constructed in accordance with an embodiment of the present invention;

Fig. 2 is an axial sectional view taken along the line 2—2 of Fig. 1, but with the type removed;

Fig. 3 is a detail view of an element froming a part of the structure illustrated in Figs. 1 and 2;

Fig. 4 is a plan view, on a reduced scale, of type embodying the present invention and shown removed from the printing roller or cylinder;

Fig. 5 is a view similar to Fig. 1, but showing another embodiment of the present invention;

Fig. 6 is a view similar to Fig. 1, but showing still another embodiment of the present invention; and

Fig.7 is an axial sectional view taken along the line 7—7 of Fig. 6.

Referring to the drawings in detail, and initially to Figs. 1 to 4 thereof, a printing roller or cylinder is there illustrated and generally identified by the reference numeral **10**. The printing roller **10** includes a cylindrical body **12** which is suitably supported on a rotatable shaft **14** and has a screw threaded outer surface **16**. Two securing ring members, generally identified by the refer-

ence numerals **18** and **20**, respectively, are mounted on the body **12** in a manner to be relatively movable in the axial direction. In the embodiment of Figs. 1 and 2, both securing ring members **18** and **20** are internally threaded to screw onto the threaded outer surface **16** of the body **12**, however, it is to be understood that one or the other of the two securing ring members may be fixed to or formed integral with the cylindrical body **12**. As seen in Fig. 2, the securing ring member **18** is formed with a stepped, cylindrical peripheral surface which includes a relatively small diameter portion **22** and a relatively large diameter portion **24**. The radial face separating the surface portions **22** and **24** is undercut so that an annular lip **26** extends axially from the surface portion **24** and overlies, and is spaced radially from, the surface portion **22**.

The outer surface **28** of the securing ring member **20** has substantially the same diameter as the surface portion **24** of ring member **18**, and the securing ring member **20** is formed with a concentric annular recess **30** opening axially toward the ring member **18** and having a diameter which is substantially the same as the diameter of surface portion **22** on the ring member **18** for a purpose hereinafter set forth. The edge of the securing ring member **20** facing toward the ring member **18** is undercut, as at **32**, to provide an annular lip **34** extending axially from the surface **28** in the direction toward the other securing ring member and having an inner surface which is diametrically larger than the surface portion **22** of ring member **18**.

In order to support a type member, of a kind hereinafter described, between the securing ring members **18** and **20**, the illustrated embodiment of the invention includes a plurality of spacing and support ring members **36** mounted on the cylindrical body **12** between the securing ring members **18** and **20**. At least the one of the spacing and support ring members **36** which is adjacent to the securing ring member **20** is internally threaded and screwed onto the threaded outer surface **16** of the body **12**. Each of the spacing and support ring members **36** has an outer cylindrical surface which is of substantially the same diameter as the surface portion **22** of ring member **18** so that the surface portion **22** and the outer surfaces of ring members **36** form a uniform cylindrical surface for supporting type constructed in accordance with the present invention and the ring member **36** adjacent to the ring member **20** is adapted to telescope into the recess **30** of the latter.

The type constructed in accordance with the present invention (Fig. 4) includes a resilient, metal backing plate **38**, for example, formed of semi-hard spring brass, and which is relatively thin, for example, having a thickness of approximately twelve thousands of an inch. A layer of rubber **40** is adhesively bonded to a surface of the backing plate **38** and terminates short of the edges of the latter. The rubber layer **40** has suitable raised characters **42** thereon defining the material that is to be imprinted, and such raised characters may constitute a single letter or a syllable, word or series of words, as on logotype. The backing plate **38** is normally flat (Fig. 4), but, by reason of its thinness and resiliency, the backing plate can be easily flexed to conform to the curvature of the cylindrical surface defined by the members **36** and the surface portion **22** of ring member **18**. Further, the flexibility of the plate **38** and the rubber type layer **40** thereon permits the same type assembly to be mounted on printing rollers or cylinders of different diameters.

When the type assembly (Fig. 4) is wrapped around the cylindrical supporting surface and the securing ring member **20** is screwed onto the body **12** to move axially toward the ring member **18**, the lips **26** and **34** overlie and grip the circumferentially extending edges **44** of the resilient backing plate **38**. In order to prevent outward bowing or buckling of the type assembly as a result of the axial compressive stress exerted by the securing ring members **18** and **20**, at least two hold-down ring members, each being generally identified by the reference numeral **46** (Fig. 3), are mounted on the body **12** and interspersed among the support and spacing ring members **36**. In the embodiment illustrated by Figs. 1 and 2, four hold-down ring members **46** are shown, and each ring member **46** has an outer diameter which is, for the most part, no larger and preferably smaller than the outer diameters of the adjacent rings **36**. However, each ring member **46** is formed with a radially enlarged localized portion **48** (Fig. 3) having a tangentially extending finger or tooth **50** thereon to define a notch **52**. The radial distance from the finger or tooth **50** to the center of the ring member **46** is preferably the same as the radial distance from each of the lips **26** and **34** to the center of the related securing ring member so that, when the ring members **46** are mounted on the cylindrical body **12**, the fingers **50** will extend above the cylindrical surfaces of the ring members **36** supporting the backing plate **38** of the type assembly (Fig. 2) and will be adapted to overlie and hold down the axially extending edges **54** of the backing plate **38**, as in Fig. 1. As seen in Fig. 2, the hold-down ring members **46** are placed on the cylindrical body **12** so that the fingers **50** thereof extend in opposite directions and are angularly displaced to engage the opposite axially extending edges of the resilient backing plate.

In securing the type on a printing roller in accordance with this invention, a sufficient number of spacing and support ring members **36** are positioned between the ring members **18** and **20** to ensure that the latter will slightly telescope over the adjacent ring member **36** when the circumferential edges **44** of the type backing plate are securely held by the annular lips **26** and **34**, and the hold-down ring members **46** are positioned so that the fingers **50** engage the axial edges **54** of the type backing plate approximately at the centers of such edges. When the ring member **36** closest to the ring member **20** is screwed onto the body **12** in the direction toward ring member **18**, the remaining ring members **36** and the hold-down ring member **46** are clamped in position and relative angular displacement thereof is frictionally resisted. Thus, in securing the type assembly on the printing roller **10**, the backing plate **38** of the type assembly is held manually against the cylindrical supporting surface and pushed towards the ring member **18** until the lip **26** grips the related edge **44** of the backing plate. Then, the hold-down ring members **46** are angularly adjusted until the fingers **50** thereof grip the opposite axial edges **54** of the backing plate **38**, and the end ring **36**, adjacent the securing ring member **20**, is tightened down to prevent movement of the hold-down ring members. Finally, the securing ring member **20** is screwed onto the body **12** so that the lip **34** engages over the related circumferential edge of the backing plate **38**.

Referring now to Fig. 5, another printing roller or cylinder arrangement is there illustrated, wherein rubber type of the kind herein described and also rubber type of the kind disclosed in the above identified application of Ira S. Gottscho are secured to one printing roller. In Fig. 5, the printing roller **10***a* includes a cylindrical body **12***a* which is suitably mounted on a rotatable shaft **14***a* and has a screw threaded outer surface portion **16***a* extending from one end thereof. A radial flange **58** is formed on the other end of the body **12***a*, and securing ring members **18***a* and **20***a* are mounted on the cylindrical body. The ring members **18***a* and **20***a* are generally similar to the correspondingly numbered parts of the embodiment of Figs. 1 and 2 with the exception that the securing ring member **18***a* is merely slidable on the body **12***a* and does not threadably engage the latter. Spacing and support ring members **36** are arranged on the body **12***a* between the ring members **18***a* and **20***a*, and hold-down ring members **46** are interspersed among the

ring members 36, with the ring members 36 and 46 having the same construction as the parts bearing the same reference numerals and described in detail in connection with the embodiment of Figs. 1 and 2. Thus, a type member of the kind described herein and including a resilient metal backing plate 38 and rubber type adhered thereto is supported on the outer surface of the ring members 36 with the lips 26*a* and 34*a* of the ring members 18*a* and 20*a*, respectively, gripping the circumferential edges of the backing plate 38 and the fingers 50 of the hold-down ring members 46 gripping the opposite axially extending edges of the backing plate.

In the embodiment of Fig. 5, a series of type gripping metal rings 60, of the kind disclosed in the above identified application of Ira S. Gottscho, are axially slidable on the cylindrical body 12*a* between the flange 58 and the securing ring member 18*a*. The type gripping rings 60 are each formed with a relatively wide base portion 62 and a relatively narrow peripheral portion 64, and the adjacent peripheral portions 64 define annular grooves 66 therebetween which open radially outward through relatively restricted spaces 68. The rubber type 70 to be held by the rings 60 has rubber projections 72 extending from the back thereof, and each projection 72 has a cross-sectional configuration which conforms, generally, to that of the space defined between the peripheral portions 64 of adjacent rings 60. The projections 72 are formed so that, when engaged between successive rings 60, the bases 62 of the latter tend to be spaced apart slightly, whereby the application of an axial force against the rings 60, to compact the latter, causes the projections 72 to be compressed between the peripheral portions 64 of the successive rings 60. Thus, the type 70 is securely held and supported on the rings 60.

In assembling the type and securing structure of Fig. 5, the ring member 36 closest to the securing ring member 20*a* is threaded on the surface portion 16*a* of the body 12*a* and the rings 60, ring member 18*a*, ring members 46 and the remaining ring member 36 are all axially compressed or compacted against the flange 58 to secure the type 70 to the rings 60 and to prevent relative rotation of the hold-down ring members 46. Finally, the securing ring member 20*a* is threaded onto the body 12*a* to grip the opposite circumferential edges of the type backing 38 between the ring members 18*a* and 20*a*.

With an arrangement of the kind illustrated in Fig. 5, it is possible to employ type 40 having a resilient metal backing 38 in the form of a logotype to define a relatively permanent portion of the imprinted legend, while type 70 is employed for a changeable and relatively small portion of the legend to be imprinted.

Further, it is not necessary for the type, of the kind indicated by the reference numeral 70, to be spaced axially apart from the type 40 supported on the printing roller, as in Fig. 5. For example, and as shown in Figs. 6 and 7, the type gripping rings 60 and the hold-down ring members 46 may be interspersed with each other on a cylindrical body 12*b* between securing ring members 18*b* and 20*b*. In the arrangement shown in Figs. 6 and 7, the peripheral edges of the type gripping rings 60 provide support for the resilient backing plate 38 of the type 40, and the plate 38 is formed with a cut-out or opening 74 to accommodate the type 70 and so that the projections 72 on the latter may be gripped in the annular spaces provided between the peripheral portions of the underlying rings 60. In order that the hold-down ring members 46 will not interfere with the gripping of the projections 72 between the peripheral portions of the rings 60, the outer diameter of each ring member 46, for the most part, does not exceed the outer diameter of the base portion 62 of each ring 60 (Fig. 7). Further, the radially enlarged portion of each ring member 46 extends outwardly between the adjacent rings 60 so that the finger 50 carried thereby may grip the associated axial edge of the backing plate 38 (Fig. 6). Finally, it is to be understood that, in the embodiment of Figs. 6 and 7, the bases 62 of the gripping rings 60 are narrower than those in Fig. 5 so that the projections 72 on the back of the type 70 will be compressed between the peripheral portions of the rings 60 when the latter and the ring members 46 are axially compacted between the securing ring member 18*b*, which may be integral with the body 12*b*, as shown, and the threaded ring member 36 which is closest to the securing ring member 20*b*. While the embodiment of Figs. 6 and 7 has type 40 on the backing plate 38 only to one side of the opening 74 for the type 70, it is to be understood that the permanent type 40 on the backing plate 38 may extend all around the opening 74 to provide the unchanging portion of an impression, while the type 70 is employed for a part of the impression which is changed from time to time.

From the foregoing description of illustrative embodiments of the present invention, it is apparent that rubber type and structure for securing the latter on printing rollers of cylinders have been provided wherein the type may define a large and complex impression in an integral piece, as a logotype, and such type can conveniently be used in combination with the rubber type and the holder therefor described in the application of Ira S. Gottscho, Ser. No. 219,867. Further, by the addition or elimination of spacing ring members 36 and by angular shifting of the hold-down ring members 46, the described type securing structure can be adapted to hold or secure type pieces of different dimensions.

It is to be understood that where rubber type is referred to herein the invention is not limited to type made of rubber, as obviously type of other suitable flexible material may be employed.

While illustrative embodiments of the invention have been described in detail and shown in the accompanying drawings, it is to be understood that the present invention is not limited to these precise embodiments and that various changes and modifications may be effected therein without departing from the spirit or scope of the invention as defined in the appended claims.

What is claimed is:

1. A printing roller comprising the combination of a cylindrical body, at least two spacing and support ring members extending around said body, a resilient backing plate adapted to be flexed to conform to, and be carried by the curved peripheries of said spacing and support ring members, a plurality of hold-down ring members on said cylindrical body between said spacing and support ring members, said hold-down ring members being rotatable on said body and each having a radially enlarged portion extending outwardly beyond the peripheries of said spacing and support ring members and formed with a tangential gripping finger, said hold-down ring members being arranged with the gripping fingers thereof extending in opposite directions and angularly spaced to overlie and grip the opposite axial edges of said backing plate, means for urging said spacing and support ring members axially together thereby to grip said hold-down ring members and prevent relative angular displacement of the latter, and securing means on said body gripping the opposite circumferentially extending edges of said backing plate.

2. A printing roller according to claim 1; wherein said securing means includes two securing ring members on said cylindrical body and movable axially relative to each other with said spacing and support ring members interposed between said securing ring members, each of said securing ring members having an annular lip extending axially from the periphery thereof and having an inside diameter slightly larger than the peripheral diameter of said spacing and support rings, the annular lips of said securing ring members extending toward each other and overyling the opposite circumferential edge portions of said backing plate.

3. A printing roller according to claim 1; wherein

said means for urging together said spacing and support ring members includes external screw threads on at least a portion of said cylindrical body and internal threads on at least one of said spacing and support ring members and threadably engaging said external screw threads of the body so that said spacing and support ring members can be axially compacted to frictionally grip said hold-down ring members therebetween for preventing rotation of the latter relative to said cylindrical body.

4. A printing roller according to claim 2; wherein at least a portion of said cylindrical body is formed with external screw threads and at least one of said two securing ring members is internally threaded and threadably engages said screw threads of the cylindrical body, said one of the securing ring members having a concentric cylindrical recess opening axially in the direction toward the other of said securing ring members and telescopically receiving the adjacent one of said spacing and support ring members.

5. A printing roller according to claim 4; wherein said means for urging together the spacing and support ring members includes internal threads on at least said adjacent one of the spacing and support ring members and threadably engaging on said screw threads of the cylindrical body so that said spacing and support ring members can be axially compacted to frictionally grip said hold-down ring members therebetween for preventing rotation of the latter relative to said cylindrical body.

6. A printing roller comprising the combination of a cylindrical body, at least two spacing and support ring members extending around said body, a subtantially rectangular and resilient backing plate adapted to be flexed to conform to the curved peripheries of said rings and carried by the latter, rubber type permanently secured to at least a portion of the outer surface of said backing plate, securing means on said body gripping the opposite circumferentially extending edges of said backing plate, hold-down means on said body gripping the opposite axially extending edges of said backing plate, other rubber type having integral rubber projections extending from the back thereof, a series of gripping ring members axially movable on said cylindrical body, said gripping ring members defining annular spaces therebetween opening radially outward through restricted passages and said rubber projections having cross-sections complementary to the cross-sections of said annular spaces and restricted passages, and means axially compacting said gripping ring members to compress said projections between successive gripping ring members.

7. A printing roller according to claim 6; wherein said gripping ring members are axially movable on said cylindrical body; and wherein said securing means includes two securing ring members on said cylindrical body and movable axially relative to each other with said spacing and support ring members interposed between said securing ring members, each of said securing ring members having an annular lip extending axially from the periphery thereof and formed with an inside diameter slightly greater than the peripheral diameter of said spacing and support rings, the annular lips of said securing ring members extending toward each other and overlying and gripping the opposite circumferential edge portions of said backing plate.

8. A printing roller according to claim 7; wherein said hold-down means includes a plurality of hold-down ring members on said cylindrical body at locations between said spacing and support ring members, each of said hold-down ring members having a radially enlarged portion extending outwardly beyond the peripheries of said spacing and support ring members and formed with a tangential gripping finger, said hold-down ring members being arranged with their gripping fingers extending in opposite directions to overlie and grip the opposite axial edges of said backing plate.

9. A printing roller according to claim 8; wherein said cylindrical body has a radial, outwardly directed flange at one end thereof and said series of gripping ring members is disposed between said flange and one of said securing ring members; and wherein at least a portion of said cylindrial body extending from the other end thereof is externally screw threaded and at least the one of said spacing and support ring members adjacent to the other of said securing ring members is internally threaded and engages said screw threaded portion of the cylindrical body so that said gripping ring members, said one securing ring member, the other spacing and support ring members and said hold-down ring members can be axially compacted and frictionally held against rotation relative to said body between said flange and said one spacing and support ring member.

10. A printing roller according to claim 9; wherein the other of said securing ring members is internally threaded and engaged on said threaded portion of the cylindrical body and is formed with a concentric recess opening axially in the direction toward said one securing ring member and telescopically receives said one spacing and support ring member.

11. A printing roller according to claim 8; wherein said gripping ring members are disposed between said spacing and support ring members and said hold-down ring members are interspersed axially among said gripping ring members.

12. A printing roller according to claim 11; wherein the outer peripheral diameter of each of said gripping ring members is substantially equal to that of said spacing and support ring members so that said backing plate rests on said gripping ring members and said spacing and support ring members; and wherein said annular spaces defined between successive gripping ring members are disposed radially outward of said hold-down ring members.

13. A printing roller according to claim 12; wherein one of said securing ring members is disposed adjacent one end of said cylindrical body and the latter is externally screw threaded at least along a substantial portion extending from the other end of said body; and wherein the one of said spacing and support ring members closest to the other of said securing ring members is internally threaded and engaged on the screw threads of said body to axially compact the other spacing and support ring members, said gripping ring members and said hold-down ring members between said one securing ring member and said one spacing and support ring member.

14. A printing roller according to claim 13; wherein the other of said securing ring members is internally threaded and engaged on the screw threaded portion of said cylindrical body and said other securing ring member is formed with a concentric, cylindrical recess opening axially toward said one securing ring member and telescopically receiving said one spacing and support ring member.

15. A printing roller according to claim 14; wherein said backing plate has an opening therein, and said other type is accommodated in said opening of the backing plate.

References Cited in the file of this patent

UNITED STATES PATENTS

516,885	Barr	Mar. 20, 1894
811,776	Koehler	Feb. 6, 1906
1,648,598	Smith	Nov. 8, 1927
1,669,416	Huebner	May 15, 1928
1,930,807	Hueber	Oct. 17, 1933
2,210,500	Rohland	Aug. 6, 1940
2,643,609	Gottscho	June 30, 1953