

Nov. 2, 1948.

A. W. METZNER

2,452,591

PIN WHEEL FEED

Original Filed Dec. 9, 1937

2 Sheets-Sheet 1

Fig. 1

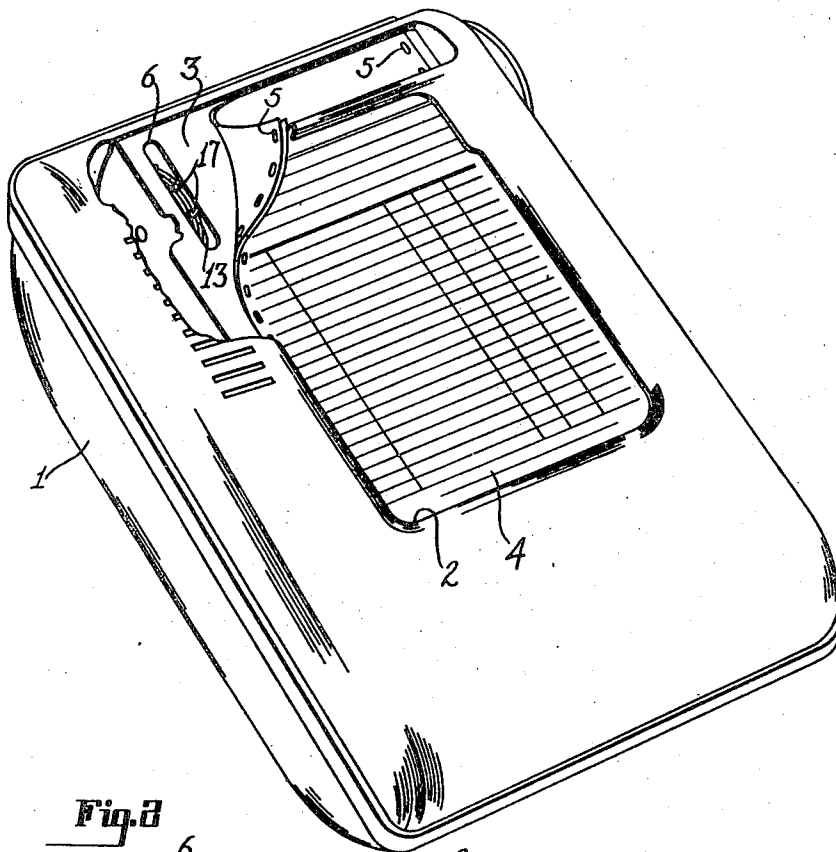
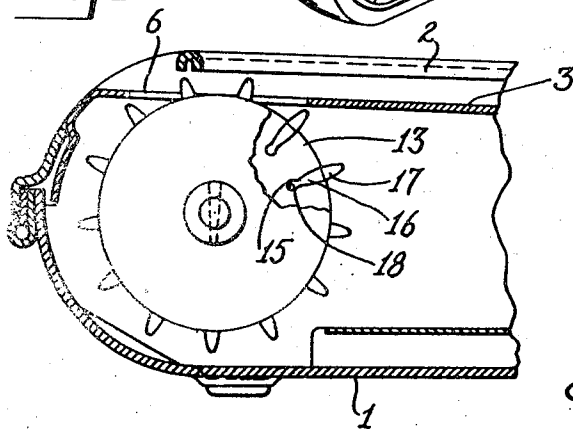


Fig. 2



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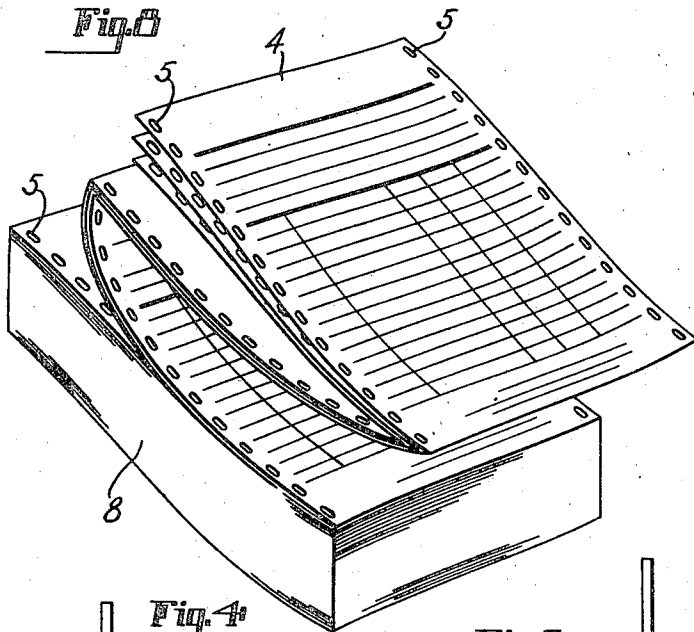
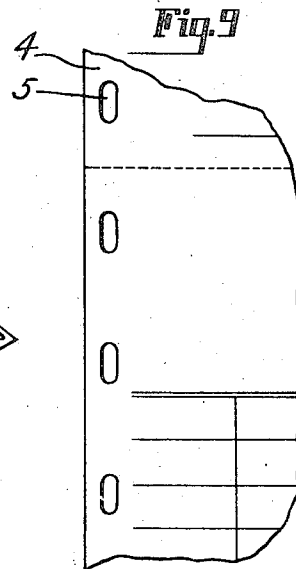
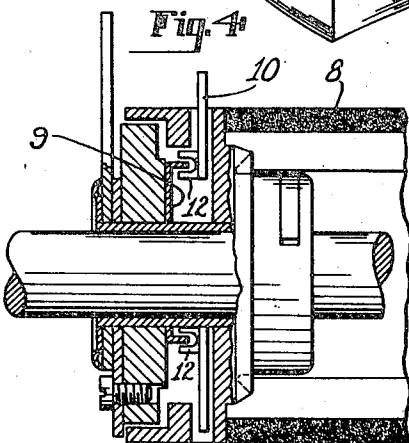
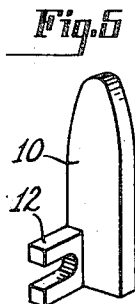
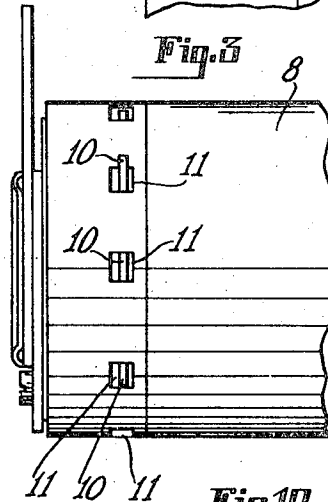
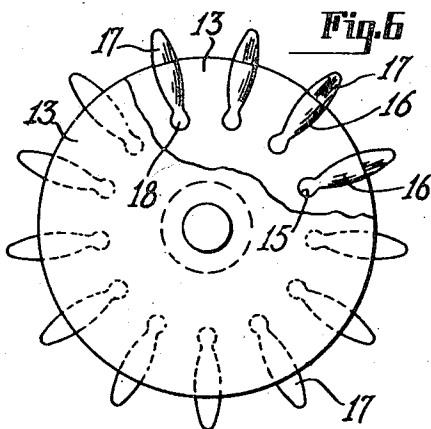
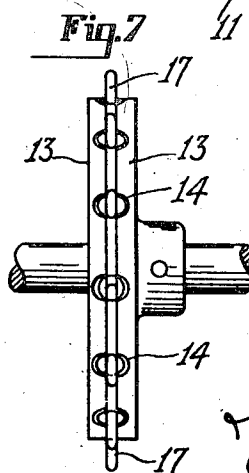
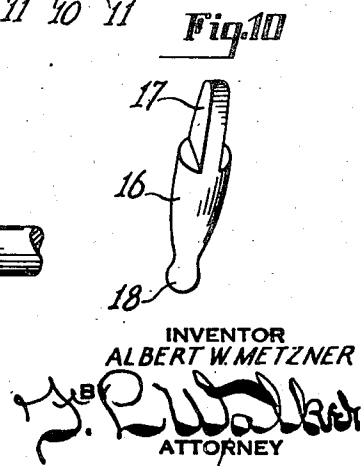
A. W. METZNER

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PIN WHEEL FEED

Original Filed Dec. 9, 1937

2 Sheets-Sheet 2



UNITED STATES PATENT OFFICE

2,452,591

PIN-WHEEL FEED

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Original application December 9, 1937, Serial No. 179,021. Divided and this application March 9, 1942, Serial No. 433,915

20 Claims. (Cl. 271-2.3)

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This invention pertains to strip feeding means for writing and imprinting apparatus, wherein a continuous strip of record receiving material having therein a succession of longitudinally spaced apertures is advanced past a record receiving position by progressive engagement of a traveling series of feeding pins in the longitudinally spaced apertures thereof, and comprises an improved pin wheel or sprocket feeding unit therefor.

The present is a division of copending application for Letters Patent Serial No. 179,021, filed December 9, 1937, now matured into Letters Patent No. 2,309,656.

The expansion and contraction of paper strips employed for record purposes, especially when the strips are of considerable width, as used in tabulating and computing machines, addressograph and other imprinting apparatus, presents a troublesome problem. Prior to printing and punching, the material is kept in tightly wound stock rolls in a comparatively dry condition as it comes from the mills. While in the stock rolls it is not exposed to atmosphere and does not readily absorb any appreciable degree of moisture. Consequently, when punched the material is ordinarily in condition of approximately maximum contraction. However, while being printed and punched it is exposed to atmospheric conditions. Many localities wherein the material is to be used after manufacture are damp or subject to rainy weather, and the storage place may be in a mill or factory wherein manufacturing conditions necessitate a moist humid air condition. Under such conditions, the material printed and punched while dry absorbs moisture and expands to such degree that it will no longer fit the spaced pin feed devices for which it was originally intended, unless allowance has been made for such expansion. Inasmuch as the degree of expansion varies with changing atmospheric conditions and some grades of material are more susceptible than others to absorption of moisture and consequent expansion, it is difficult indeed to anticipate such dimensional variations. The present floating pin feed construction wherein the feeding pins may automatically change their plane of travel to coincide with that of the apertures to be engaged, solves this problem and renders the feeding devices universally adaptable to varying conditions.

In the present feeding unit there are contemplated floating or laterally movable feeding pins or teeth which will automatically accommodate themselves to relative displacement or unalignment of successive feeding apertures in the rec-

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ord strip, and which may be economically manufactured at low costs with minimum machine operations wherein the pins or teeth are individually and automatically adjustable laterally one relative to another.

The object of the invention is to improve the construction, as well as the means and mode of operation, of pin type strip feeding devices whereby they may not only be economically manufactured, but will be more efficient in use, automatic in operation, uniform in action, of simple construction and unlikely to get out of repair.

A further object of the invention is to provide a pin type feeding device which will automatically adjust itself laterally to compensate for expansion and contraction of the record strips being fed and inequalities in the relation of successive apertures therein engaged by the feeding pins or teeth, by automatically adjusting their position to the changed position of the feed holes.

A further object of the invention is to provide a pin type feeding unit wherein the feeding pins or teeth are individually laterally adjustable one relative to another.

A further object of the invention is to provide a pin type feeding device for use with apertured record material having the advantageous structural features, and meritorious characteristics herein mentioned.

With the above primary and other incidental objects in view as will more fully appear in the specification, the invention consists of the features of construction, the parts and combinations thereof, and the mode of operation, or their equivalents, as hereinafter described and set forth in the claims.

In the accompanying drawings, wherein are shown the preferred but obviously not necessarily the only forms of embodiment of the invention,

Fig. 1 is a perspective view of a popular type of portable manifolding register in which the present invention is embodied.

Fig. 2 is a sectional view of a portion of the register illustrated in Fig. 1.

Fig. 3 is a front elevation.

Fig. 4 is a sectional view of a writing or imprinting machine platen roll having radially disposed disappearing feeding pins, which, in accordance with the present invention, are individually laterally adjustable additionally to their radial adjustments.

Fig. 5 is a detail perspective view of one of the adjustable pin elements employed in the construction illustrated in Figs. 3 and 4.

Figs. 6 and 7 are respectively side and edge

elevations of a further modified embodiment of the invention having individually adjustable feeding pins.

Fig. 8 is a perspective view of a packet of stationery for use with the present type of feeding pins or teeth.

Fig. 9 is an enlarged fragmentary view of the marginally punched stationery.

Fig. 10 is a detail perspective view of one of the pins employed in the construction shown in Figs. 6 and 7.

Like parts are indicated by similar characters of reference throughout the several views.

While the present invention is herein shown and described in its relation with autographic or manifolding registers, it is to be understood that such disclosure is for illustrative purposes only and with no intent to unduly limit the invention which is applicable to a wide range of progressive strip feeding purposes. For use with continuous form stationery, the device is applicable to various types of writing and imprinting machines including typewriters, tabulating and billing machines, addressograph mechanisms, check writers and analogous apparatus wherein a strip of record material is progressively advanced past a writing position at which it receives a succession of longitudinally spaced inscriptions or recorded data. The present floating type of pin wheel or sprocket construction is also applicable to purposes other than feeding of continuous form stationery.

Referring to the autographic register illustrated in Figs. 1 and 2, 1 indicates the case or housing having in its top an opening 2, beneath which is the writing tablet 3, over which continuous strip stationery 4 is advanced from a supply compartment within the housing into writing position upon the tablet 3. The stationery strips 4, of which a packet is shown in Fig. 8, are provided with marginal longitudinally spaced apertures 5 for engagement of pin type feeding means, which in the present instance comprises the pin wheel unit forming the subject matter hereof.

In the particular type of autographic register illustrated, a pair of pin wheel feeding devices are rotatively mounted in the forward portion of the case or housing beneath the writing tablet, which is provided with slots 6 through which the feeding pins or teeth project into feeding engagement in the marginal apertures 5 of the strips 4.

In lieu of the conventional round tapered feeding pins having a fixed plane of rotation in which they engage in round holes in the record material substantially larger than the pins, the present feeding pins are flat and beveled or tapered. They are loosely mounted for to and fro lateral adjustment to automatically accommodate themselves to variations of position of the marginal apertures 5 due either to expansion or contraction of the material or to inequalities in the manufacture of the stationery.

It has heretofore been proposed to accomplish a somewhat analogous purpose by providing rigidly mounted feeding pins upon a pin wheel body or carrier, and mounting the body or carrier for to and fro axial movement. However, inasmuch as the movement must be effected by the camming or lateral pressure of the margins of the apertures in the record strips against the engaging pins, such complete pin wheel assembly is found too heavy and its inertia too great to be overcome by the edgewise pressure of the margin of the strip aperture. As a result, the

margin of the strip aperture may yield or bend, or indeed be torn. However, by rendering the feeding pins individually adjustable independently of their mount, the record strip is not required to overcome the inertia of the entire pin wheel, but only one pin at a time. The pins offering much less resistance than the entire assembly are readily adjusted by the aperture edge pressure thereon, without distortion of the strip.

Such pin wheel or sprocket units are ordinarily used in pairs. If so, it is not necessary that both sprockets or pin wheels shall be of the free floating type. However, when two relatively spaced pin wheels or sprockets are simultaneously engageable in apertures in the opposite margins of the strips 4, as is the usual construction, one of the units is preferably of rigid form while the other is provided with teeth of adjustable or floating type as are herein illustrated.

The application of floating or laterally adjustable feeding pins to a pin type platen roll for a writing or imprinting machine is illustrated in Figs. 3, 4 and 5. The construction is of the type described and claimed in Patent No. 2,000,649, of May 7, 1935, wherein a series of radially disposed feeding pins are progressively extended and retracted within circumferentially spaced holes in the platen roll by rotation of the latter. This is effected by providing within the platen roll 8 a temporarily stationary cam 9 about which the radially adjustable feeding pins 10 are caused to travel as the roll rotates.

In the present construction, the feeding pins 10 are flat and the circumferentially spaced holes 11, within which the pins are mounted for reciprocation, are somewhat wider than the thickness of the pins to permit to and fro lateral motion within the limits of the holes. The pins 10 which may be stamped from sheet material are formed with a slotted wing 12 within the slot of which the lateral flange of the cam 9 engages. As the pins travel about the stationary cam 9 they are reciprocated into and out of the platen roll and are free for lateral adjustment additional to their reciprocatory motion. The slot in the wing 12 and cam flange engaging therein are of sufficient depth to retain operative interengagement throughout the full range of lateral movement of the pins permitted by the size of the holes 11.

The pins 10 are free for individual lateral movement each relative to the others.

A further variation of the individually adjustable pins is that illustrated in Figs. 6 and 7, wherein two discs 13 fixedly connected with each other have in their contiguous faces registering radial slots 14, which at their inner ends communicate with spherical sockets 15. The pins 16 flattened at their outer ends 17 are formed with spherical heads 18 at their inner ends engageable in the sockets 15 for to and fro swinging or wobble movement within the limits of the registering slots 14. Each pin 16 is capable of a limited individual to and fro adjustment independently of the other pins. Such movement influenced by the relative positions of succeeding apertures in the strips enables automatic accommodation of the pin wheel to different locations of the apertures incident to expansion or contraction and imperfections of manufacture of the stationery.

As shown in Figs. 8 and 9 the marginally punched stationery is provided with a succession of longitudinally spaced elongated apertures or slots 5. Such slots being relatively narrow may be located closely adjacent to the lateral margin

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of the strip where they will occupy materially less portion of the strip than the usual round holes and such narrow slot like apertures are much less conspicuous.

Whether the record material is expanded or contracted by varying weather conditions or the apertures are misplaced due to imperfections in manufacture, there will be no decided or abrupt offset of succeeding apertures and points of the pins will readily find the succeeding apertures, and by lateral pressure upon the side of the aperture slot will shift laterally into a common plane with the aperture. The lateral adjustment of the feeding pins or teeth, whether affected individually or collectively, is due to the camming influence of the engaging pin or tooth on the side of the aperture. Due to such lateral pressure of the record material and feeding pin one against the other, the pin will yield laterally until it assumes a plane of travel coincident with the marginal apertures.

While for the reasons stated flat feeding pins cooperating with slotted apertures in the record material are quite desirable, the present invention is not limited thereto, but the floating pin construction herein described may embody conventional round tapered pins engageable in round longitudinally spaced holes in the record material. Since such round tapered pins and round holes are well known in this art, and their illustration in the present yielding or floating pin feed construction would necessitate substantial duplication of the present drawings, such specific illustration has been omitted, but the use of such floating round pins is deemed to be within the scope of the invention as expressed in the claims hereof.

From the above description it will be apparent that there is thus provided a device of the character described possessing the particular features of advantage before enumerated as desirable, but which obviously is susceptible of modification in its form, proportions, detail construction and arrangement of parts without departing from the principle involved or sacrificing any of its advantages.

While in order to comply with the statute the invention has been described in language more or less specific as to structural features, it is to be understood that the invention is not limited to the specific features shown, but that the means and construction herein disclosed comprise the preferred form of several modes of putting the invention into effect, and the invention is therefore claimed in any of its forms or modifications within the legitimate and valid scope of the appended claims.

Having thus described my invention, I claim:

1. In a record making apparatus wherein continuous relatively adjustable superposed record strips each having a succession of longitudinally spaced record receiving areas are progressively aligned and registered at a record receiving position with like areas of another of the strips, and wherein each strip has therein a succession of longitudinally spaced elongated slots for progressive engagement of the strips with a series of traveling flat feeding pins by which the strips are advanced past a record receiving position, the combination with such strip of a rotary carrier and a series of radial spaced flat teeth carried thereby engageable in the slots of the strip mounted for limited to and fro axial movement relative to the carrier into agreement with succeeding slots of the strips and movable radially

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relative to the carrier into and out of feeding engagement therewith.

2. In a record making apparatus wherein continuous relatively adjustable superposed record strips each having a succession of longitudinally spaced record receiving areas are progressively aligned and registered at a record receiving position with like areas of another of the strips, and wherein each strip has therein a succession of longitudinally spaced elongated slots for progressive engagement of the strips with a series of traveling flat feeding pins by which the strips are advanced past a record receiving position, a sprocket wheel including a series of radial spaced flat teeth progressively engageable in the slots in the strips, the teeth being mounted for to and fro axial adjustment into agreement with succeeding slots in the strips and radially into and out of feeding engagement therewith.

3. In a pin type feeding means for advancing a continuous strip of material having therein a succession of longitudinally spaced holes for engagement therein of traveling feeding pins, a traveling carrier, a series of spaced feeding pins mounted thereon for to and fro lateral motion transversely to their path of travel independently of each other and the carrier into agreement with succeeding holes in the strip simultaneously with their unison advancement by the travel of the carrier.

4. In a pin type feeding means for advancing continuous strips of material having therein a succession of longitudinally spaced holes for engagement therein of traveling feeding pins, a rotary pin wheel including a series of radially disposed spaced pins mounted therein for individual to and fro swinging motion one relative to another in radial planes transverse to the plane of rotation of the pin wheel into agreement with succeeding holes in the strip and subject to unison rotary travel motion by which the strip is advanced.

5. In a record making apparatus wherein continuous relatively adjustable superposed record strips each having a succession of longitudinally spaced record receiving areas are progressively aligned and registered at a record receiving position with like areas of another of the strips, and wherein each strip has therein a succession of longitudinally spaced elongated slots for progressive engagement of the strips with a series of traveling flat feeding pins by which the strips are advanced past a record receiving position, characterized by a pin type feeding device for the strips, including a traveling series of spaced laterally flattened feeding pins progressively engageable in the holes in the strips and a carrier therefor by which the pins are advanced in a path of travel substantially coincident with the planes of such flattened pins while engaged in the holes in the strips, and with respect to which carrier the feeding pins are both transversely and radially movable.

6. In a record making apparatus wherein continuous relatively adjustable superposed record strips each having a succession of longitudinally spaced record receiving areas are progressively aligned and registered at a record receiving position with like areas of another of the strips, and wherein each strip has therein a succession of longitudinally spaced elongated slots for progressive engagement of the strips with a series of traveling flat feeding pins by which the strips are advanced past a record receiving position, including a traveling series of relatively spaced

flat pins engageable in corresponding narrow elongated slots in the strips for advancing the strips in unison with their travel motion and a carrier for said pins upon which the pins are mounted for limited individual lateral adjustment relative to the carrier by camming action of the teeth and strips as the teeth enter the slots thereof.

7. In a record making apparatus wherein continuous relatively adjustable superposed record strips each having a succession of longitudinally spaced record receiving areas are progressively aligned and registered at a record receiving position with like areas of another of the strips, and wherein each strip has therein a succession of longitudinally spaced elongated slots for progressive engagement of the strips with a series of traveling flat feeding pins by which the strips are advanced past a record receiving position, a plurality of traveling spaced flat feeding pins progressively engageable in the slots in the strips for advancing the strips in unison with their travel movement and a support therefor relative to which the pins are mounted for free to and fro lateral motion incident to the camming action of the pins and strips as the pins enter the slots in the strips and radial movement into and out of feeding engagement with the strips.

8. In a record making apparatus wherein continuous relatively adjustable superposed record strips each having a succession of longitudinally spaced record receiving areas are progressively aligned and registered at a record receiving position with like areas of another of the strips, and wherein each strip has therein a succession of longitudinally spaced elongated slots for progressive engagement of the strips with a series of traveling flat feeding pins by which the strips are advanced past a record receiving position, a traveling series of flat pins the planes of which are disposed substantially coincident with their path of travel and engageable in a succession of longitudinally spaced relatively narrow longitudinally elongated slots in the strips for advancing the strips in unison with their travel motion, and a carrier for the pins and upon which the pins are mounted for individual movement laterally and radially into and out of feeding engagement with the strips.

9. In a record making apparatus wherein continuous relatively adjustable superposed record strips each having a succession of longitudinally spaced record receiving areas are progressively aligned and registered at a record receiving position with like areas of another of the strips, and wherein each strip has therein a succession of longitudinally spaced elongated slots for progressive engagement of the strips with a series of traveling flat feeding pins by which the strips are advanced past a record receiving position, a traveling series of relatively spaced laterally adjustable flat feeding pins mounted for free to and fro automatic adjustment simultaneously with their travel movement, the construction and arrangement being such that the pins automatically adjust themselves laterally in accordance with the relative misalignment of succeeding slots in the strips while advancing the strips in unison with their travel motion, and a carrier for the feeding pins upon which the pins are mounted for reciprocatory movement radially into and out of feeding engagement with the strips.

10. In a record making apparatus wherein continuous relatively adjustable superposed record strips each having a succession of longitudinally

spaced record receiving areas are progressively aligned and registered at a record receiving position with like areas of another of the strips, and wherein each strip has therein a succession of longitudinally spaced configurations for progressive engagement of the strips with a series of independently adjustable traveling feeding pins by which the strips are advanced past a record receiving position, a traveling carrier therefor in which the feeding pins are mounted for individual to and fro lateral and reciprocatory adjustment relative to the traveling carrier and relative to each other simultaneously with the travel movement of the carrier, the construction and arrangement being such that the feeding pins are progressively projected into and withdrawn from feeding engagement in configurations of the record strips, and are independently laterally adjusted by their engagement in the configurations of the strips into agreement therewith during their advancement with the traveling carrier in event certain pins and corresponding configurations to be engaged thereby are misaligned.

11. Pin type feeding means for writing or imprinting apparatus wherein continuous superposed strips of record material having therein a succession of longitudinally spaced feeding configurations are progressively advanced past a record receiving position by engagement of traveling feeding pins in said configurations, including a traveling pin carrier mounted for operation in a predetermined plane, a series of traveling feeding pins, and mounting means therefor by which the pins are loosely mounted for lateral relative adjustment into different parallel planes of travel simultaneously with their advancement by the pin carrier and for reciprocatory movement radially into and out of feeding engagement with the strips.

12. In a record making apparatus wherein continuous relatively adjustable superposed record strips each having a succession of longitudinally spaced record receiving areas are progressively aligned and registered at a record receiving position with like areas of another of the strips, and wherein each strip has herein a succession of longitudinally spaced apertures for progressive engagement of the strips with a series of traveling feeding pins by which the strips are advanced past a record receiving position, the combination with such strips of a pin type feeding device comprising a traveling series of relatively spaced feeding pins progressively engageable in the succession of longitudinally spaced apertures of the strips and a traveling support therefore mounted for movement in a fixed plane of operation upon which the spaced pins are mounted for advancement while in engagement in the longitudinally spaced apertures of the strips and relative to which support the pins are free for lateral shifting motion independently of each other in directions transversely of the plane of operation of the pin support into agreement with the path of travel of succeeding apertures by the camming engagement of the pins and strips as the pins enter the apertures therein and a driver for actuating the traveling pin support in a single plane of operation.

13. In a record making apparatus wherein continuous relatively adjustable superposed record strips each having a succession of longitudinally spaced record receiving areas are progressively aligned and registered at a record receiving position with like areas of another of the strips, and wherein each strip has therein a succession of

longitudinally spaced apertures for progressive engagement of the strips with a series of traveling feeding pins by which the strips are advanced past a record receiving position, the combination with such strips of a pin wheel unit comprising a rotary disc, and a series of separate radially disposed circumferentially spaced traveling feeding pins on the disc progressively engageable in the apertures in the strips and mounted for independent to and fro lateral motion relative to each other transversely of its plane of rotation simultaneously with their rotary advancement, and driving means with which the disc is operatively connected for travel motion in a single plane of rotation and relative to which the pins are laterally movable independently of the disc.

14. In a record making apparatus wherein continuous relatively adjustable superposed record strips each having a succession of longitudinally spaced record receiving areas are progressively aligned and registered at a record receiving position with like areas of another of the strips, and wherein each strip has therein a succession of longitudinally spaced apertures for progressive engagement of the strips with a series of traveling flat feeding pins by which the strips are advanced past a record receiving position, a pin type feeding means therefor including a pin type feeding device comprising a traveling series of relatively spaced pins progressively engageable in the apertures in the strips and a traveling support therefor mounted for movement in a single plane of operation, upon which the pins are mounted for unison advancement but free for limited individual lateral adjustment independently of each other relative to the support into the plane of travel of succeeding apertures of the strips simultaneously with their advancement by camming action of the teeth and strips as the teeth enter the apertures thereof and driving means relative to which the pin support is held against lateral movement.

15. In a pin type feeding device for feeding continuous superposed strips of record material having therein longitudinally spaced feeding configurations, a pin wheel unit including a rotary disc operative in a predetermined plane and held against lateral movement therefrom, and a plurality of separately mounted strip engaging feeding pins carried thereby and mounted for travel motion in unison with the disc but free for lateral movement independently of each other into and out of alternate parallel paths of travel.

16. A strip feeding device for writing or imprinting machines, wherein a continuous strip of record material having therein a succession of longitudinally spaced configurations is progressively advanced past an impression receiving position, including a series of relatively spaced feeding pins, a traveling carrier therefor relatively to which the pins are bodily projected beyond the carrier into engagement with succeeding configurations of the strip and withdrawn therefrom into the carrier in synchronism with the travel motion of the carrier, said pins being mounted on said carrier for lateral movement relative to the carrier transversely of their travel motion.

17. A strip feeding device for writing or imprinting machines, wherein a continuous strip of record material having therein a succession of longitudinally spaced configurations is progressively advanced past an impression receiving position, including a series of relatively spaced feed-

ing pins, a traveling carrier therefor in relation to which the pins are mounted for advance travel motion in unison with the carrier, by which the succeeding configurations of the strip are progressively engaged thereby, and for alternating outward and inward motion relative to the carrier into and out of engagement with the configurations of the strip and for further alternating transverse movement independently of the carrier in accordance with variations of alignment of the configurations, and means for controlling the advance travel motion and alternating in and out motion of the pins by actuation of the carrier, the alternating transverse movement of the pins being controlled by their engagement in the configurations of the strip of material.

18. A strip feeding device for a writing or imprinting apparatus, wherein a continuous strip of record material having longitudinally spaced configurations therein is progressively advanced past a recording position, including a succession of separate relatively spaced and independently adjustable traveling feeding pins progressively engageable in successive configurations of the strip, guiding means for maintaining the pins in a circuitous path of travel relative to which guiding means the pins are free for independent lateral shifting movement transversely of said circuitous path of travel into agreement with the lineal disposition of the configurations of the strip, and means for transmitting travel motion to the pins.

19. A strip feeding device for a writing or imprinting apparatus, wherein a continuous strip of record material having longitudinally spaced configurations therein is progressively advanced past a recording position, including a traveling series of relatively spaced feeding pins advanced through a circuitous path of travel and having progressive engagement with succeeding configurations of the strip, said pins being capable of to and fro alternating motion independently of each other transversely of their circuitous path of travel, and an annular mount for the pins relative to which the pins are separately adjustable.

20. A strip feeding device for a writing or imprinting apparatus, wherein a continuous strip of record material having longitudinally spaced configurations therein is progressively advanced past a recording position, including a traveling series of relatively spaced feeding pins having progressive engagement in longitudinally spaced configurations of the strip, a device of endless configurations for directing the feeding pins through a predetermined circuitous path of travel, said pins being mounted relative to said device for to and fro movement independently of each other transversely of their circuitous path of travel independently of said pin directing device.

ALBERT W. METZNER.

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