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F. E. GREEN, JR
PERFORATION PATTERN

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2 Sheets-Sheet J


F/G. 1


FIG. 2


FIG. 3


F/G. 4


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F/G. 6


FIG. 7



F/G. 8


FIG. 9



## 2

having a greater transverse dimension than the stamps shown in FIGS. 1 and 2 and embodying the present invention;

FIG. 4 is a fragmentary plan view of a section of a 5 sheet of stamps;

FIG. 5 is a diagrammatic view showing the perforations enlarged with an illustration of the relative arrangement and sizes of the perforations;

FIG. 6 is a fragmentary plan view of a sheet of stamps embodying the invention;

FIG. 7 is a view similar to FIG. 6 in which perforations are of diamond shape;

FIG. 8 is a top fragmentary view of a feed roller with its associated cogs or pins;
FIG. 9 is a view similar to FIG. 8 with a single cog or pin;

FIG. 10 is another view showing the roller provided with a pair of large cogs for engaging the larger spaced perforations;
FIG. 11 is a view similar to FIG. 8 in which the feed roller is provided with a pair of spaced large cogs or pins and a pair of smaller cogs or pins for driving a sheet having similarly arranged perforations;
FIG. 12 is a perspective view of a feed roller associated with a strip of stamps, the feed roller having three large cogs for engaging three large spaced perforations of the strip;

FIG. 13 is a modification in which a strip is provided with a single large perforation and a multiplicity of smaller perforations at each side; and
FIG. 14 is a diagrammatic view showing the relative association of perforations in stamp assemblies illustrating a modified arrangement of cogs on the feeding drum and the relative spacing.
In FIG. 1 a section of a stamp strip E, one stamp wide, is shown in which a longitudinally extending (in the direction of arrow Z FIG. 1) and aligned row of large perforations 1, having a predetermined diameter such as .093", have their centers equally spaced longitudinally (in the direction of arrow Z FIG. 1) of the strip to receive similarly spaced cogs or pins on a drive wheel or drum in a dispensing machine of any suitable type. The large perforations 1 are centrally spaced transversely of stamp strip $E$ (in the direction of arrow X-FIG. 1) and it will be noted in FIG. 1 that the width of the stamp strip shown is such that laterally spaced large perforations $\mathbf{1} a$ of the same diameter as perforations 1 are intersected and preferably bisected by the longitudinal sides of strip E.
Small perforations 2 each $0.040^{\prime \prime}$ in diameter are longitudinally and transversely aligned with each other for engaging cogs or pins appropriately arranged on a drive wheel or drum of a dispenser as hereinbefore mentioned. However, small perforations 2 are more closely positioned with respect to the large center perforation 1 than to the large laterally positioned perforations $1 a$. It will be seen from an inspection of FIGS. 5 and 14 that the centers 15 of small perforations 2 are spaced a distance $0.140^{\prime \prime}$ from the center 19 of large perforation 1 and are spaced a distance of $0.149^{\prime \prime}$ respectively from the centers 21 of large perforations $1 a$ while the centers 21 of large perforations $1 a$ are spaced a distance of $0.289^{\prime \prime}$ respectively from the center of large perforation 1 for an overall center to center distance between the centers 21 of large perforations $1 a$ of $0.578^{\prime \prime}$. There it will be seen from FIG. 5 the $a+b=a^{\prime}+b^{\prime}$.
This same relative perforation size for large perforations 1 and $1 a$ and small perforations 2 , and spacing between large perforations 1 and $1 a$ and small perforations $\mathbf{2}$ is utilized carried for all of the stamp assembly forms, i.e. single strip, multiple strip or sheet, and corresponds to the size and spacing of the large cogs 23 (FIG. 14)
and the small cogs 25 of a dispenser feeding drum 27. By the arrangement shown, dispenser feeding drums having only small pins or cogs (33-FIG. 8), only large pins or cogs (35-FIG. 9, 42-FIG. 10 or 53-FIG. 12), or both large and small pins or cogs (47-FIGS. 11 and 14) may be utilized, to perform the feeding function of a stamp strip of single or multiple form, or of a stamp from a dispenser. As a result of this concept, it is unnecessary to provide a special arrangement of perforations for different customers having different types of stamp dispensing machines as the disclosed novel arrangement of perforations accommodates a multiplicty of drive pin or drive cog arrangements. It will be understood that not only does the spacing of feed pins or cogs on feeding drums in dispensing machines vary in many instances, but also that the relative size of the driving pins or cogs may vary, and it will be obvious to one skilled in the art that it is unnecessary to have the pins of the same identical diameter as the perforations in which they engage, as the feeding operation results from the engagement of a pin or $\operatorname{cog}$ with the wall defining the perforation.
It will be further obvious that the sizes and spacings of the perforations 1, $1 a$ and 2 and of the cogs 23 and 25 is subject not only to normal tolerances but may also be varied within the scope of the disclosed concept.
It should of course be recognized that the perforations $1 a, 2,1,2,1 a$ also define a transversely disposed weakened line 29 (FIG. 1) to facilitate severance of the stamps one from the other.
In FIG. 2 there is illustrated a strip of stamps F two stamps wide separated by longitudinally arranged (in the direction of arrow Z) perforations 3 and provided with a transverse (in the direction of arrow $X$ ) row of large perforations $1 b$ and interposed small perforations $2 a$; with laterally spaced large perforations $1 c$ intersected and preferably bisected by the longitudinal sides of strip $\mathbf{F}$. Perforations $1 b$ and $1 c$ and perforations $2 a$ are respectively disposed for accommodating cogs or pins on a suitably proportioned dispenser feeding drum. In the embodiment of FIG. 2 the strip F is adapted to be travelled in the direction of arrow Z . Dual strip of stamps F of FIG. 2 can be longitudinally separated by the provision of perforations 3 or can be transversely severed along the weakened line $29 a$ formed by perforations $1 c, 1 b$ and $2 a$, it being noted that these perforations are sufficiently close to provide a convenient severance point for delivery of stamps of a predetermined amount. It is to be understood that the relative size of and spacing between large perforations $1 b$ and $1 c$ and small perforations $2 a$ are the same as those previously described with respect to FIGS. 1,5 , and 14.
In FIG. 3 there is shown a strip of stamps $G$ two stamps wide having longitudinally extending (in the direction of arrow Z ) severance perforations $3 a$ each, the strip being of a width greater than the width of the individual stamps of FIGS. 1 and 2. Because of this increased width, each individual stamp includes a number of transversely disposed (in the direction of arrow $\mathbf{X}$ ) large perforations $1 d$ and $1 e$ and small perforations $2 b$ and $2 c$ in excess of the number of perforations for strip F of FIG. 2 with perforations $2 c$ being intersected and preferably bisected by the longitudinal edges of strip G. As shown, each individual stamp strip of the dual strip $G$ includes two complete large perforations $1 d$ and two complete small perforations $\mathbf{2 b}$. In this embodiment the longitudinal severance perforations $3 a$ intercept large intermediate perforations $1 e$ in each transverse array of perforations. By the embodiments of FIGS. 1, 2 and 3 it will be obvious that the same concept and arrangement of perforations can be utilized regardless of whether a single strip of stamps is being dispensed or whether a strip two or more stamps wide is being dispensed. Further it will be obvious that the same inventive concept with reference to the perforations can be embodied in stamps regardless of their
width, it merely being necessary to have the alternate arrays of smaller and larger perforations to accommodate feed wheels or feed drums with corresponding registering pins or cogs.
Further in connection with FIGS. 1, 2 and 3, it will be obvious that the same principle may be utilized on a strip of stamps including so-called half strips which may be arranged at either margin of the strip and represent a relative value with respect to the whole stamp. For instance, the strip shown in FIGS. 2 and 3 may instead of being two whole strips of stamps comprehend an additional stamp, i.e. be two and one-half stamps in width and the same thought can be expanded to provide four and one-half stamps or other proportionate arrangements of stamp strips or sheets.

In FIG. 4, which is a fragmentary view of a sheet of stamps perforated for use with feed drums having several predetermined cog arrangements, the arrangement of the transverse (in the direction of arrow $X$ ) perforations, i.e. the large perforations $1 f$ and small interposed perforations $2 d$, is similar to that of FIGS. 1, 2 and 3. Inasmuch as it is contemplated that the embodiment of FIG. 4 represents a relatively large sheet of stamps, it will be obvious that this sheet may be fed either longitudinally (in the direction of arrow $Z$ ) or transversely through a stamp dispensing apparatus; it only being necessary that the pins or cogs register with certain predetermined spaced feed perforations in one direction or the other direction, in accordance with the movement of the sheet through the dispensing apparatus, as indicated by the arrow $Z$ at the right side of FIG. 4.
The perforations functioning for the feeding of the sheet of FIG. 4 can also operate as severance perforations to facilitate removal of a transverse strip of stamps or individual groups of stamps by including longitudinally extending severance perforations $3 b$.

In FIG. 6 there is illustrated a section of a sheet of stamps in which the transverse (in the direction of arrow X) perforations are arranged and are of a size corresponding to the size and arrangement of the embodiments of FIGS. 1, 2 and 4 with the spacing corresponding to the diagrammatic view of FIGS. 5 and 14. In this figure large perforations $1 g$ in the transversely spaced arrays of perforations have interposed therebetween small perforations $2 e$. The arrangement of perforations is such that a large perforation $1 h$ is located centrally at the transverse center of each stamp with longitudinal (in the direction of arrow Z) two laterally spaced large perforations being intersected by the severance perforations $3 c$. In this connection it will be noted that strips of stamps can readily be severed from a sheet, such as shown in FIG. 6, and once severed will retain the same perforation alignment as that of strip E of FIG. 1 and strip F of FIG. 2.

In FIG. 7 the arrangement and spacing of perforations is similar to the arrangement in FIG. 6, the embodiment being a section of a sheet of stamps. However, in FIG. 7 the large perforations $1 k$ and small perforations $2 f$ are of diamond shape to accommodate similarly shaped pins or cogs on a feed drum. Perforations of diamond shape or other desired shape, i.e. hexagonal or otherwise, would obviously accommodate pins or cogs similarly shaped, or larger or smaller pins of annular form in cross section. The perforations $3 d$ may either be circular as shown or of diamond or any other suitable shape.

In FIGS. 8, 9, 10 and 11 there are illustrated in fragmentary view portions of feed drums or spools with associated strips or sheets of stamps in which are illustrated modified arrays of feed pins for normal longitudinal feeding of the stamps. While the disclosures of FIGS. 8 through 11 are illustrative of modified forms of pin arrays for feeding strips or sheets, it will be obvious to one skilled in the art that other arrangements of feed pins on the feed drums can be readily provided, as long as these feed pins are positioned to appropriately engage with the walls defining the perforations at suitably aligned points
in the strips or sheets of stamps to provide the essential drive by the feed drum of the strip or sheet. It is to be understood that FIGS. 8 through 11 are for the purpose of illustration and the elements, i.e., the drum and the sheet, are relatively enlarged.
As is known in the art, the driving medium, i.e., the pin or cog, or pins or cogs, provided on the feed drum, will be of a size and number to properly and accurately advance its associated strip or sheet and in this connection other factors may be involved such as the nature of the strip or sheet being fed, including the width of the sheet, its relative stiffness, the speed of the feeding, the nature of the coating and other factors may necessarily be considered

In FIG. 8 a section of a feed drum 33 is illustrated having four small pins 34, all of the same dimension for engaging the walls of the transverse perforations of a strip or sheet similarly arranged and of approximately the same size. Such an arrangement of feed pins on a feed roller could readily be associated with the basic arrays of perforations shown. It should be understood that a small pin 23 will pass into and then out of a large perforation, such as perforation 1 of FIG. 1, without engaging the sides thereof and that the feed will be imported to the strip by those small pins 34 which engage the walls of perforations.

In FIG. 9 a feed drum 35 is shown with a single large pin 36 for engaging large perforations $1 m$ in a strip or sheet, it being understood that the strip or sheet section 38 is fragmentary and that in the event feed drum 35 is used in connection with a sheet, additional large pins might be appropriately spaced along feed drum 35 to provide the necessary feeding of the sheet.
In FIG. 10 a strip or sheet 39 is shown to include large perforations $1 n$ and small perforations $2 g$ spaced between the large perforations 1 n . In this embodiment a feed drum 42 is shown provided with a pair of spaced large pins or cogs 43, there being no pins or cogs for engagement with small perforations $2 g$ of strip or sheet 39 .
In FIG. 11 a strip or sheet 44 is shown provided with spaced large perforations $1 p$ and intermediate small perforations $2 h$. The strip or sheet 44 is shown driven by a drum 47 provided with the large pins or cogs 48 appropriately spaced for engaging the large perforations $1 p$ in the strip or sheet 44 . Smaller pins 49 are shown on drum 47 positioned between large pins or cogs 48 for engaging the small spaced perforations $2 h$
In FIG. 12 a strip of stamps 50 is shown having an array of large and small transverse perforations $1 r$ and $2 k$, respectively, alternately arranged in a manner similar to that shown in FIG. 2. In this figure a feed drum 53 is shown provided with three large pins or cogs 54 suitably spaced for engaging the three large transversely arranged perforations $1 r$.

In FIG. 13 a strip of stamps 55 is illustrated in which the transverse severance point includes a central large perforation $1 s$ and a multiplicity of smaller perforations $2 m$, small perforations $2 m$ being relatively closely associated to facilitate severance with one of each group of smaller perforations 2 m spaced with respect to large perforations $1 s$ in accordance with the showings of FIGS 5 and 14. In a stamp strip such as shown in FIG. 13, a feed drum may be utilized having a series of spaced small cogs to engage certain of the small transverse perforations $2 m$ of the strip or a feed drum could be utilized having a single feed pin or cog for engaging the large central perforations $1 s$, such a feed drum being illustrated in FIG. 9.

It will be noted by reference to FIG. 4 that the spacing between the centers of the rows of transverse perforations is $.875^{\prime \prime}$ and this dimension will be the basic spacing pins on feed wheels or rolls for feeding the various strips and sheets in the normal manner or in a longitudinal direction.
It is not the intent of applicant to limit his concept 75
except to the extent of providing various spacings of feed perforations in a strip, sheet or roll of stamps which are so constructed, arranged and positioned that such a sheet, strip or roll will be adaptable for use in the numerous conventional arrangements of cogs and pins provided on conventional stamp dispensing machines. In other words, by the present concept it is not necessary to provide a specific array of feed perforations for use in a specific machine, but rather it is contemplated that there shall be an array of perforations modified as to size and spacing provided in a strip or sheet of stamps so that it can be fed by any standard stamp feeding or vending equipment.

While the present illustrations are directed primarily to large and small feed perforations alternately arranged, it is possible that more than a single small feed perforation can be arranged between each of the spaced larger feed perforations. Also in this connection, while it is contemplated that the larger perforations be regularly spaced in a longitudinally extending line, the smaller perforations may be appropriately arranged both as to number and as to spacing.
As stated above, the purpose of the instant concept is to permit the use of a strip, sheet or roll of stamps in a plurality of types of machines having a different array of feed cogs or pins, thereby preventing the expense of duplication in the manufacture of stamps for general sale to sources where the stamp feeding or vending machine may have modified arrays of feed cogs or pins.
What is claimed is:

1. An elongated stamp strip comprising a plurality of stamps defined by longitudinally extending perforations, said perforations further defining a longitudinal line of severance between the several stamps and said strip being formed with spaced rows of perforations defining transverse weakened lines of severance, said transverse lines of perforations including first spaced perforations of a first predetermined diameter and interposed second perforations of lesser diameter, at least one pair of said second perforations having disposed equidistant therebetween one of said first perforations with the center of said one of said first perforations spaced a first predetermined distance from the centers of said pair of second perforations, said pair of second perforations furthermore being disposed between and equidistant from a pair of first perforations with the centers of each one of said pair of second perforations being spaced a second predetermined distance from the center of its respective first perforation of said pair of first perforations.
2. An elongated stamp strip comprising a plurality of stamps defined by longitudinally extending perforations, said perforations defining a longitudinal line of severance between the several stamps and said strip being formed with spaced rows of perforations defining transverse weakened lines of severance, said transverse lines of perforations including first spaced perforations of a first predetermined diameter and interposed second perforations of lesser diameter, said first perforations being equidistant apart with at least one of said second perforations disposed to one side of at least one of said first perforations and spaced a first predetermined distance therefrom and with at least one other of said second perforations disposed to the other side of said at least one of said first perforations and spaced a second predetermined distance therefrom.
3. A stamp sheet comprising a multiplicity of spaced parallel rows of first perforations defining lines of severance extending in a first direction and at least two spaced parallel rows of other perforations extending in a direction ninety degrees to said first direction and defining additional lines of severance, said rows of other perforations including second perforations and interposed third perforations of a diameter lesser in magnitude than the diameter of said second perforations, said second perforations being equally spaced with respect to each other
with alternate ones of said second perforations being medially intersected by said lines of severance formed by said first perforations.
4. The stamp sheet of claim 3 wherein said second and third perforations are irregularly spaced with respect to each other.
5. The stamp sheet of claim 3 wherein at least one of said third perforations is disposed to one side of at least one of said second perforations and has its center spaced a first predetermined distance from the center of said at least one of said second perforations, and with at least one other of said third perforations disposed to the other side of said at least one of said second perforations and having its center spaced a second predetermined distance from the center of said at least one of said second perforations.
6. A stamp strip for use in a dispensing means including a feed drum provided with predetermined arrays of driving cogs or pins, said stamp strip being of elongated form and provided with spaced transversely extending parallel rows of perforations adapted to coact with the driving cogs or pins of a dispensing means, and in addition defining transverse lines of severance between the stamps, said perforations including first perforations having diameters of a first predetermined size and second perforations having diameters of a second predetermined size, one of said first perforations being medially disposed with respect to the longitudinal sides of the strip in each of said rows of perforations.
7. The stamp strip of claim 6 wherein certain of said perforations are formed with angularly arranged walls.
8. In a stamp sheet for use in a dispensing machine having a feed drum with cogs or pins about its periphery, said sheet being formed with a multiplicity of spaced parallel rows of first perforations defining lines of severance in one direction and spaced parallel rows of other perforations extending normal to said lines of severance for coaction with the cogs or pins of a dispensing machine and further defining additional lines of severance, said rows of other perforations including equally spaced large perforations having a diameter of $.093^{\prime \prime}$ and interposed third perforations having a diameter of $.040^{\prime \prime}$, with alternate ones of said second perforations being medially intersected by respective ones of said severance lines defined by said rows of first perforations with at least one of said third perforations disposed on each side of each one of said second perforations, so that the centers of said third perforations which are disposed to one side of said second perforations are spaced first predetermined distances from the centers of their respective second perforations and so that the centers of said third perforations which are disposed to the other side of said second perforations are spaced a second predetermined distance from the centers of their respective second perforations.
9. In a stamp strip for use in a dispensing machine having a feed drum with cogs or pins about its periphery, said stamp strip being formed with spaced parallel rows of perforations adapted to coact with the cogs of pins of the dispensing machine and defining lines of severance, said rows of perforations including a first perforation having a diameter of $.093^{\prime \prime}$ which is positioned at the transverse center of the strip, and second perforations each having a diameter of $.040^{\prime \prime}$, said second perforations being disposed respectively at alternate sides of said large positioned perforation each being spaced from said first perforation by a distance of $.140^{\prime \prime}$, said lines of severance each terminating at the marginal edges of the strip in the form of arcs of approvimaely $180^{\circ}$ one at each edge of the strip, each of said arcs having a maximum diameter of $.093^{\prime \prime}$.
10. A strip for use in a dispensing machine having a feed drum with cogs or pins about its periphery, said strip being formed with spaced parallel rows of perforations adapted to facilitate feeding of the strip by the cogs or
pins of the dispensing machine and further defining lines of severance, said rows of perforations including perforations spaced in seriatim at distances of $0.149^{\prime \prime}, 0.140^{\prime \prime}$, $0.140^{\prime \prime}$ and $0.149^{\prime \prime}$.
11. A stamp strip having colinear spaced perforations for feeding and severance, the said perforations including alternately disposed first and second perforations, the center of one of said first perforations constituting a reference, one of said second perforations having its center disposed $0.140^{\prime \prime}$ from said reference, another of said first perforations having its center disposed $0.149^{\prime \prime}$ from said center of said one of said second perforations, another of said second perforations having its center disposed $0.140^{\prime \prime}$ from said center of said another of said first perforations, and still another of said first perforations having its center disposed $0.149^{\prime \prime}$ from said center of said another of said second perforations.
12. The stamp strip of claim 2 wherein said first spaced perforations are $0.093^{\prime \prime}$ in diameter and said second perforations are $0.040^{\prime \prime}$ in diameter and wherein said first predetermined distance is $0.140^{\prime \prime}$ and said second predetermined distance is $0.149^{\prime \prime}$.
13. The stamp sheet of claim 3 wherein said second perforations are $0.093^{\prime \prime}$ in diameter and said third perforations are $0.040^{\prime \prime}$ in diameter.
14. The stamp strip of claim 5 wherein said first predetermined distance is $0.140^{\prime \prime}$ and said second predetermined distance is $0.149^{\prime \prime}$.
15. A sheet of material having formed therein a plurality of first perforations of a first size alternately disposed in a colinear array with a plurality of second perforations of a second size, said first and said second perforations having a configuration adapting same to facilitate dispensing of the sheet by a dispensing means and further facilitating severance of the sheet along an imaginary line defined by said perforations.
16. The sheet of claim 15 wherein at least one pair of said second size perforations have disposed therebetween one of said first size perforations with the center of said one of said first size perforations spaced a first predetermined distance from each center respectively of said pair of second size perforations, said pair of second size perforations furthermore being disposed between and equidistant from a pair of first size perforations with the centers of each one of said pair of second size perforations being spaced a second predetermined distance from the center of its respective first size perforation of said pair of first size perforations.
17. The sheet of claim 16 wherein said first predetermined distance is substantially $0.140^{\prime \prime}$ and said second predetermined distance is substantially $0.149^{\prime \prime}$.
18. The sheet of claim 15 wherein said first size perforations are substantially $0.093^{\prime \prime}$ in diameter and said second size perforations are substantially $0.040^{\prime \prime}$ in diameter.
19. The sheet of claim 15 including at least one colinear array of other size perforations disposed along an other imaginary line at right angles to said imaginary line along which said first and second size perforations are disposed and adapted to facilitate severance of the strip therealong.

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# UNITED STATES PATENT OFFICE CERTIFICATE OF CORRECTION 

Patent No. 3,333,688
August 1, 1967
Francis E. Green, Jr.

It is certified that error appears in the above identified patent and that said Letters Patent are hereby corrected as shown below:

Column 1, line 29, "perforations and longitudinally aligned" should read -- perforations transversely and longitudinally aligned --. Column 3, line 7, "of a stamp from a dispenser" should read -- of a stamp sheet from a dispenser --; line 55, "3a each, the strip" should read -- 3a each strip --. Column 4, line 46, "transverse center of each stamp with longitudinal (in the direction of arrow $Z$ ) two laterally spaced large perforations being intersected by the severance perforations $3 c^{\prime \prime}$ should read -- transverse center of each stamp with the two laterally spaced large perforations being intersected by longitudinal (in the direction of arrow Z) severence perforations 3c --. Column 7, line 53, "spaced a second predetermined distance" should read -- spaced second predetermined distances --.

Signed and sealed this 7 th day of July 1370.
(SEAL)
Attest:
EDWARD M.FLETCHER,JR.
WILLIAM E. SCHUYLER, JR.
Attesting Officer
Commissioner of Patents

