

FenceTrac Wind Load Capacity Chart

Post Size	Fence Height	Wind Speed (mph) ¹		Footings ^{2,3}	
		Exposure B	Exposure C	Exposure B	Exposure C
3"-11 ga	6'	127	115	12"φ x 36"	12"φ x 42"
	8'	90	81	18"φ x 36"	18"φ x 42"
4"-12 ga	6'	166	150	12"φ x 36"	12"φ x 42"
	8'	120	108	18"φ x 36"	18"φ x 42"
4"-11 ga	6'	173	157	12"φ x 36"	12"φ x 42"
	8'	130	117	18"φ x 36"	18"φ x 42"

Notes:

1. Wind speeds based on ASCE 7-05, with a span of 80" between posts.
2. Footing sizes based on 90 mph wind and an allowable average soil stress value, S_1 , of 1000 psf.
Footing sizes may vary due to site specific wind and soil conditions.
3. Footing designs based on Lateral Stability of Poles, Structural Engineering Handbook, Third Edition, chapter 7-40, eq. 32.



SNOWDEN ENGINEERING
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FENCE SYSTEM

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] This application claims the priority of U.S. Provisional Patent Application No. 61/524,976 entitled "FENCE SYSTEM," filed August 18, 2011, the contents of which are hereby incorporated by reference.

FIELD OF THE INVENTION

[0002] The invention relates to a system and method of construction of a fence panel. More particularly, the invention relates to a fence panel and method of construction wherein vertical members may be easily located between a top rail and a bottom rail in a variety of configurations.

BACKGROUND OF THE INVENTION

[0003] The use of fences is widespread. Fences are available in various materials and configurations to meet the needs of consumers. For example, common fence types for residential or light commercial use include chain link fence and picket fence. However, variations of these types or configurations of fences are available to provide aesthetic alternatives for consumers. Some fence variants provide fence panels that are assembled off-site and transported to the installation site. Other fence variants require multiple workers to construct and erect fence panels.

SUMMARY OF THE INVENTION

[0004] The fence system of the invention provides a versatile platform that allows for various fence configurations to be easily constructed. The fence system includes a section of fence that includes first and second uprights, which may be fence posts. Horizontal segments, such as an upper and a lower rail, span between the uprights. Upper and lower rails may be formed of C-channel segments. First and second end brackets are affixed to the uprights. End brackets may also be formed of C-channel members. End brackets and rails formed of inwardly facing lengths of C-channel can receive a plurality of vertical members such as plank segments and spacer members, such as H-members. Alternatively, vertical planks can be received within the fence section, or other vertical members may be received within the fence section. In one embodiment, additional decorative or security related attachments may be installed above the upper rail. The horizontal segments preferably cap the upper and lower ends of the end brackets.

BRIEF DESCRIPTION OF THE DRAWINGS

[0005] Fig. 1 is a perspective exploded view of a fence panel of the invention;

[0006] Fig. 2 is a perspective exploded view of a gate panel of the invention;

[0007] Fig. 3 is a cross-sectional view of the top rail and base rail of Figures 1 and 2;

[0008] Fig. 4 is a cross-sectional view of spacer members of Figures 1 and 2;

[0009] Fig. 5 is a cross-sectional view of the first and second end brackets of Figures 1 and 2;

[0010] Fig. 6 is a perspective view of an embodiment of the invention having spacer members between adjacent plank panel members;

[0011] Fig. 7 is an elevation view of an embodiment of the invention having spacer members between adjacent plank panel members and having a decorative member located above the top rail of Fig. 1;

[0012] Fig. 8 is an elevation view of an embodiment of the invention wherein bamboo rods are installed as panel members;

[0013] Fig. 9 is an elevation view of an embodiment of the invention having spacer members between selected plank panel members;

[0014] Fig. 10 is an elevation view of an embodiment of the invention having spacer members between adjacent plank panel members and having a security member located above the top rail of Fig. 1;

[0015] Fig. 11 is a perspective view of an assembled gate panel of Fig. 2; and

[0016] Fig. 12 is a perspective view of a magnetic strip used to assist in fence assembly by stabilizing spacer members of the type shown in Fig. 1.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0017] Referring now to Figures 1, 2, and 6-10, a fence panel is designated generally **10**. Fence panel **10** includes a stationary panel **11** (Figs. 1, 6-10) that includes a first upright, such as first post **12**, having a panel facing side **14**. Stationary panel **11** includes a second upright, such as second post **16**, having panel facing side **18**. First end bracket **19** (Figs. 1, 2, 5-10) is preferably formed of a length of C-channel having an upper end **20**, a lower end **22**, a web **24**, a first leg **26** (Fig. 5) and a second leg **28** (Fig. 5). Web **24** is affixed to panel facing side **14** of first post **12**.

[0018] A second end bracket **30** (Figs. 1, 2, 5, and 6-10) is preferably formed of a length of C-channel having an upper end **32**, a lower end **34**, a web **36**, a first leg **38** (Fig. 5) and a second leg **40** (Fig. 5), wherein web **36** is affixed to panel facing side **18** of second post **16**. In one embodiment, end brackets **19** and **30** have legs **26** and **28** or **38** and **40** that are $1.536 \pm .050$ inches in width and that are spaced apart by $0.800 \pm .050$ inches. Web **24** and web **36** are preferably affixed to posts **12** and **16**, respectively, with bolts (not shown), although other fasteners or other methods of attachment are also contemplated, such as welding. Posts **12** and **16** can be of any configuration or material, so long as posts **12** and **16** are capable of receiving end brackets **19** and **30**.

[0019] A top rail **42** (Figs. 1-3 and 6-10) forms an upper portion of fence panel **10**. Top rail **42** is preferably formed of a length of C-channel having first end **44** and second end **46**, web **48** (Fig. 3), first leg **50** (Fig. 3) and second leg **52** (Fig. 3).

[0020] Referring now to Fig. 1, upper end **20** of first end bracket **19** is received between first leg **50** and second leg **52** of top rail **42** proximate first end **44** of top rail **42**. Upper end **32** of second end bracket **30** is received between first leg **50** and second leg **52** of top rail **42** proximate second

end **46** of top rail **42**. In a preferred embodiment, top rail **42** is bolted onto upper end of first end bracket **19** and to upper end of second end bracket **30**.

[0021] A base rail **54** (Figs. 1-3 and 6-10) forms a lower portion of fence panel **10**. Base rail **54** is preferably formed of a length of C-channel having first end **56**, second end **58**, web **60** (Fig. 3), first leg **62** (Fig. 3) and second leg **64** (Fig. 3). In one embodiment, legs **50** and **52** or **62** and **64** are 3.00 inches wide, and are formed from 18 gauge metal having a thickness of 0.49 inches. A flat hem may be found at a distal end of legs **50** and **52** or **62** and **64** having a width of 0.200 ± 0.25 inches.

[0022] Referring now to Fig. 1, lower end **22** of first end bracket **19** is received between first leg **50** and second leg **64** of base rail **54** proximate first end **56** of base rail **54**. Lower end **34** of second end bracket **30** is received between first leg **62** and second leg **64** of base rail **54** proximate second end **58** of base rail **54**. In a preferred embodiment, base rail **54** is bolted onto lower ends of first end bracket **19** and second end bracket **30**.

[0023] Referring now to Figs. 2 and 11, fence panel **10** may also be a gate panel **101**. Gate panel **101** includes a frame **111** that includes first upright **112**, second upright **116**, bottom member **115** and top member **117**. First upright **112** has a panel facing side **114** and a second upright **116** has panel facing side **118**. First end bracket **19** is preferably formed of a length of C-channel having an upper end **20**, a lower end **22**, a web **24**, a first leg **26** and a second leg **28**. Web **24** is affixed to panel facing side **114** of first upright **112**.

[0024] A second end bracket **30** is preferably formed of a length of C-channel having an upper end **32**, a lower end **34**, a web **36**, a first leg **18** and a second leg **40**. Web **36** is affixed to panel facing side **18** of second upright **116**. Web **24** and web **36** are preferably affixed to uprights **112**

and 116, respectively, with bolts (not shown), although other fasteners or other methods of attachment are also contemplated, such as welding. Uprights 112 and 116 can be of any configuration or material, so long as uprights 112 and 116 are capable of receiving end brackets 19 and 30.

[0025] Still referring primarily to Fig. 2, top rail 42 forms an upper portion of gate panel 101. Top rail 42 is preferably formed of a length of C-channel having first end 44 and second end 46, web 48, first leg 50 and second leg 52. Upper end 20 of first end bracket 19 is received between first leg 50 and second leg 52 of top rail 42 proximate first end 44 of top rail 42. Upper end 32 of second end bracket 30 is received between first leg 50 and second leg 52 of top rail 42 proximate second end 46 of top rail 42. In a preferred embodiment, top rail 42 is bolted onto upper ends of first end bracket 19 and second end bracket 30.

[0026] Bottom member 115 forms a lower portion of frame 111. A base rail 54 may be affixed to bottom member 115. Base rail 54 is preferably formed of a length of C-channel having first end 56, second end 58, web 60, first leg 62 and second leg 64. Lower end 22 of first end bracket 19 is received between first leg 50 and second leg 64 of base rail 54 proximate first end 56 of base rail 54. Lower end 34 of second end bracket 30 is received between first leg 62 and second leg 64 of base rail 54 proximate second end 58 of base rail 54. In a preferred embodiment, base rail 54 is bolted onto lower ends of first end bracket 19 and second end bracket 30.

[0027] In one embodiment, a plurality of panel members 66 (Figs. 1, 6, and 8-12) are located between top rail 42, base rail 54, first upright 12, 112 and second upright 16, 116 of stationary panel 11 and/or gate panel 101. At least one panel member 66 has an upper edge 68 (Fig. 1) that is received between first leg 50 and second leg 52 of top rail 42. At least one panel member 66

has a lower edge 70 (Fig. 1) that is received between first leg 62 and second leg 64 of base rail 54. In one embodiment, at least one of panel members 66 has a side edge 72 received in one of first end bracket 19 and second end bracket 30. Panel members 66 may be planks (Figs. 1, 6, 7, and 9-12) of wood or other materials or may be rods of bamboo (Fig. 8), metal, wood or other materials. **[Any other embodiments? Maybe panels of chain link?]** Additionally, other materials such as concrete board, composite materials, plywood or other types of planks may be used as panel members 66.

[0028] In one embodiment, a plurality of spacer members, such as spacer members 74 (Figs. 1, 2, 4, 6, 7, and 9-12) are located between adjacent panel member 66. Spacer members are preferably metallic and have an "H" shaped cross-section. **A preferred material is _____.** Spacer members 74 have an upper end 76, a lower end 78, a first receiving area 80 (Fig. 4) and a second receiving area 82 (Fig. 4). Spacer members 74 are positioned to extend between top rail 42 and base rail 54. A first panel member 66 is received in first receiving area 80 of spacer member 74. A second panel member 66 is received in second receiving area 82 of spacer member 74.

[0029] Uprights 14, 114 and 18, 118 may be extended above top rail 42 to accommodate a clamp member 84 (Figs. 7, 8, and 10) to secure an upper member, such as security member 86 (Fig. 10), decorative member 88 (Fig. 7) or other upper member to fence panel 10 or to gate panel 101.

[0030] A length of fence having a plurality of fence panels 10 of the invention may be constructed as follows. Uprights, such as posts 12 and 16, may be set into the ground. Any number of posts may be set at this stage of construction. End brackets 19 and 30 are then affixed

to the appropriate sides of the posts to facilitate construction of fence panels 10. Base rails 54 are then located to span between adjacent posts. Base rails 54 are preferably bolted into place, e.g., to lower ends 22, 34 of end brackets 19, 30, respectively. Panel members 66 are then received between legs 62 and 64 of base rail 54 and between legs 26 and 28 of end bracket 19 and between legs 38 and 40 of end bracket 30. In one embodiment, spacer members, such as H-members 74 are received between selected adjacent panel members 66.

[0031] For construction of gate panel 101, uprights 112 and 116 are affixed to top frame member 113 and bottom frame member 115 to construct frame 111. End brackets 32 and 20 are then affixed to the inwardly facing sides of uprights 112 and 116. Base rail 54 is then affixed to bottom frame member 115 to span between adjacent uprights 112 and 116. Base rail 54 is preferably bolted into place. Panel members 66, if desired, are then received between legs 62 and 64 of base rail 54 and between legs 26 and 28 of end bracket 20 and between legs 38 and 40 of end bracket 32. In one embodiment, spacer members, such as H-members 74, are located between selected adjacent panel members 66. By providing a fence assembly that can easily be assembled piece by piece, fence construction may be easily accomplished by a single worker.

[0032] To further increase ease of assembly, a securing strip, such as magnetic strip 90, may be affixed span from first upright 12 to second upright 16 or, alternatively, from first upright 112 to second upright 114. In this embodiment, first upright 12, second upright 16, first upright 112, and second upright 116 are preferably constructed of metal so that magnets 92 can support magnetic strip 90 via magnetic attraction. Securing strip 90 has one or more magnets 92 installed to strip frame 94. Securing strip 90 may then receive a plurality of parallel spacer members, such as H-members 74, which are magnetically secured to strip 90, as shown in Fig.

12, when spacer members 74 are placed between legs 62 and 64 of base rail 54. Spacer members 74 and adjacent panel members 66 are held in place while top rail 42 is installed. Magnetic strip 90 preferably has a plurality of magnets 92 along a length of strip 90. Top rail 42 is then positioned to receive upper ends of spacer members 74 and panel member 66 between legs 50 and 52 of top rail 42. Top rail 42 is then secured, e.g., bolted, into place.

[0033] Therefore, it can be seen that construction of a length of fence, i.e., construction of a series of fence panels 10, including stationary panel 11 and gate panel 101 can be accomplished by a single worker, since each component of fence panel 10 may be constructed and installed individually and locating or erecting an assembled panel is not required.

* * * *

[0034] Thus, the present invention is well adapted to carry out the objectives and attain the ends and advantages mentioned above as well as those inherent therein. While presently preferred embodiments have been described for purposes of this disclosure, numerous changes and modifications will be apparent to those of ordinary skill in the art. Such changes and modifications are encompassed within the spirit of this invention as defined by the claims.

CLAIMS

What is claimed is:

1. A fence panel comprising:
 - a first upright having a panel facing side;
 - a second upright having a panel facing side;
 - a first end bracket affixed to said panel facing side of said first upright;
 - a second end bracket affixed to said panel facing side of said second upright;
 - a top rail spanning between said first upright and said second upright;
 - a base rail below said top rail and spanning between said first upright and said second upright;at least one panel member in communication with said top rail and in communication with said base rail.
2. The fence panel according to claim 1 wherein:
 - said first end bracket has an upper end, a lower end, a web, a first leg and a second leg, wherein said web is affixed to said panel facing side of said first upright.
3. The fence panel according to claim 2 wherein:
 - said top rail has a first end, a second end, a web, a first leg and a second leg, wherein said upper end of said first end bracket is affixed to said first end of said top rail and wherein an upper end of said second end bracket is affixed to said top rail proximate said second end of said top rail.

4. The fence panel according to claim 1 wherein:

said base rail has a first end, a second end, a web, a first leg and a second leg, wherein said lower end of said first end bracket is attached to said base rail proximate said first end of said base rail and wherein a lower end of said second end bracket is attached to said base rail proximate said second end of said base rail.

5. The fence panel according to claim 1 wherein:

said at least one panel member is one of a plurality of vertical panel members.

6. The fence panel according to claim 1 wherein:

an upper end of said panel member is received between a first leg and a second leg of said top rail;

a lower end of said panel member is received between a first leg and said second leg of said base rail.

7. The fence panel according to claim 1 wherein:

said at least one panel member has a side edge supported by one of said first end bracket and said second end bracket.

8. The fence panel according to claim 7 wherein:

said side edge of said at least one panel member is received between a first leg and a second leg of one of said first end bracket and said second end bracket.

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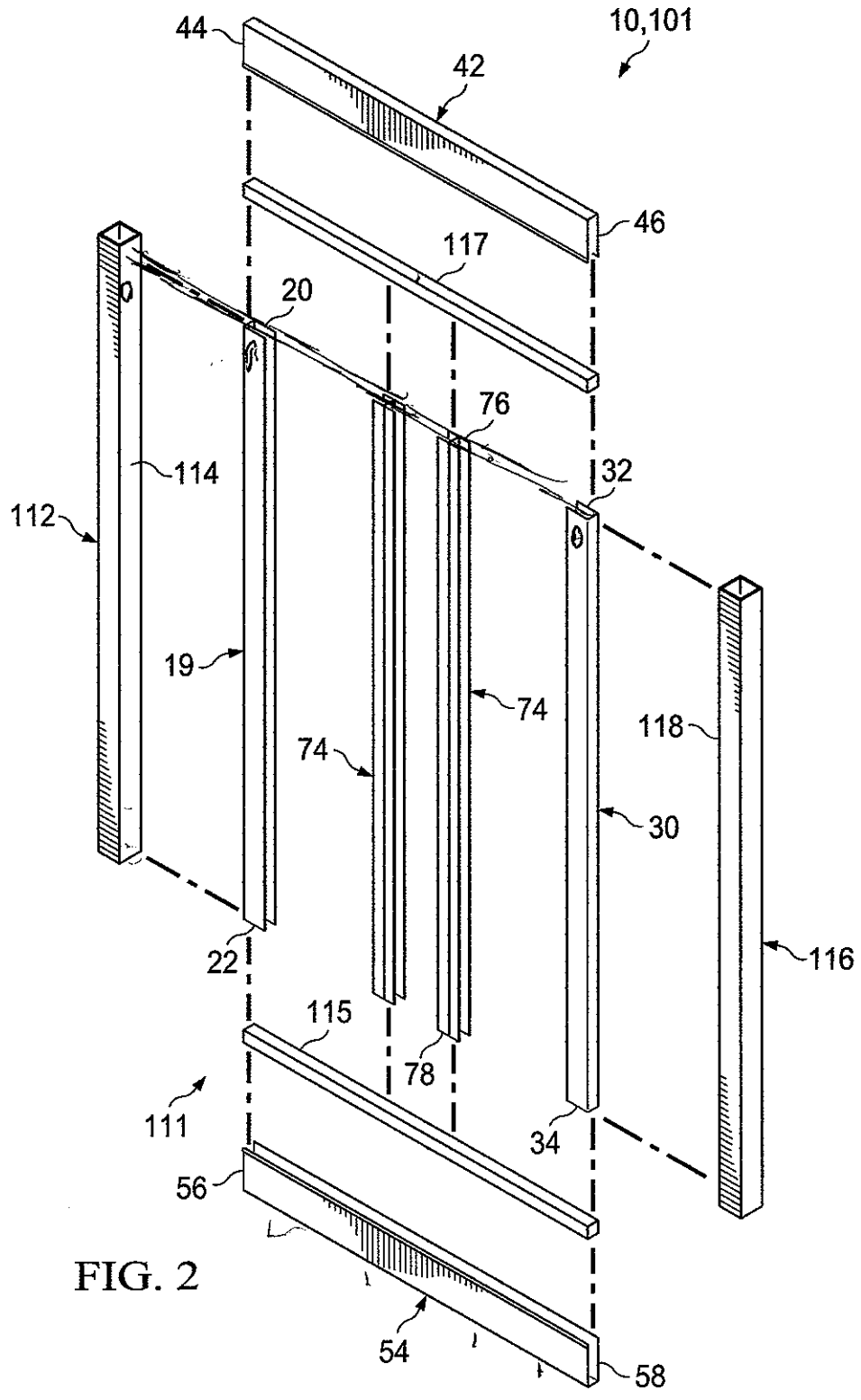


FIG. 2

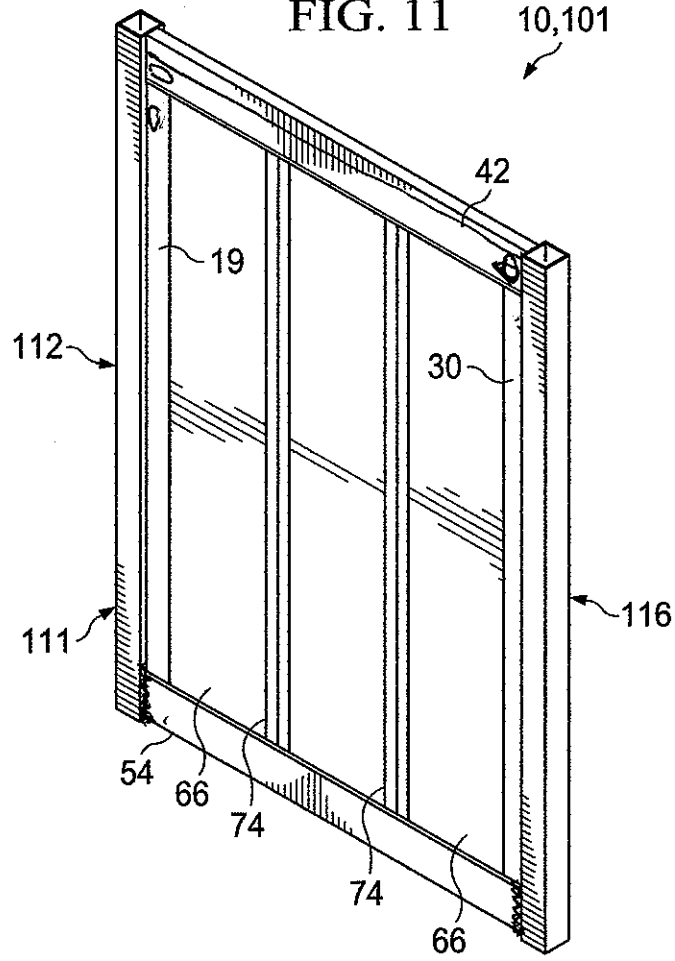
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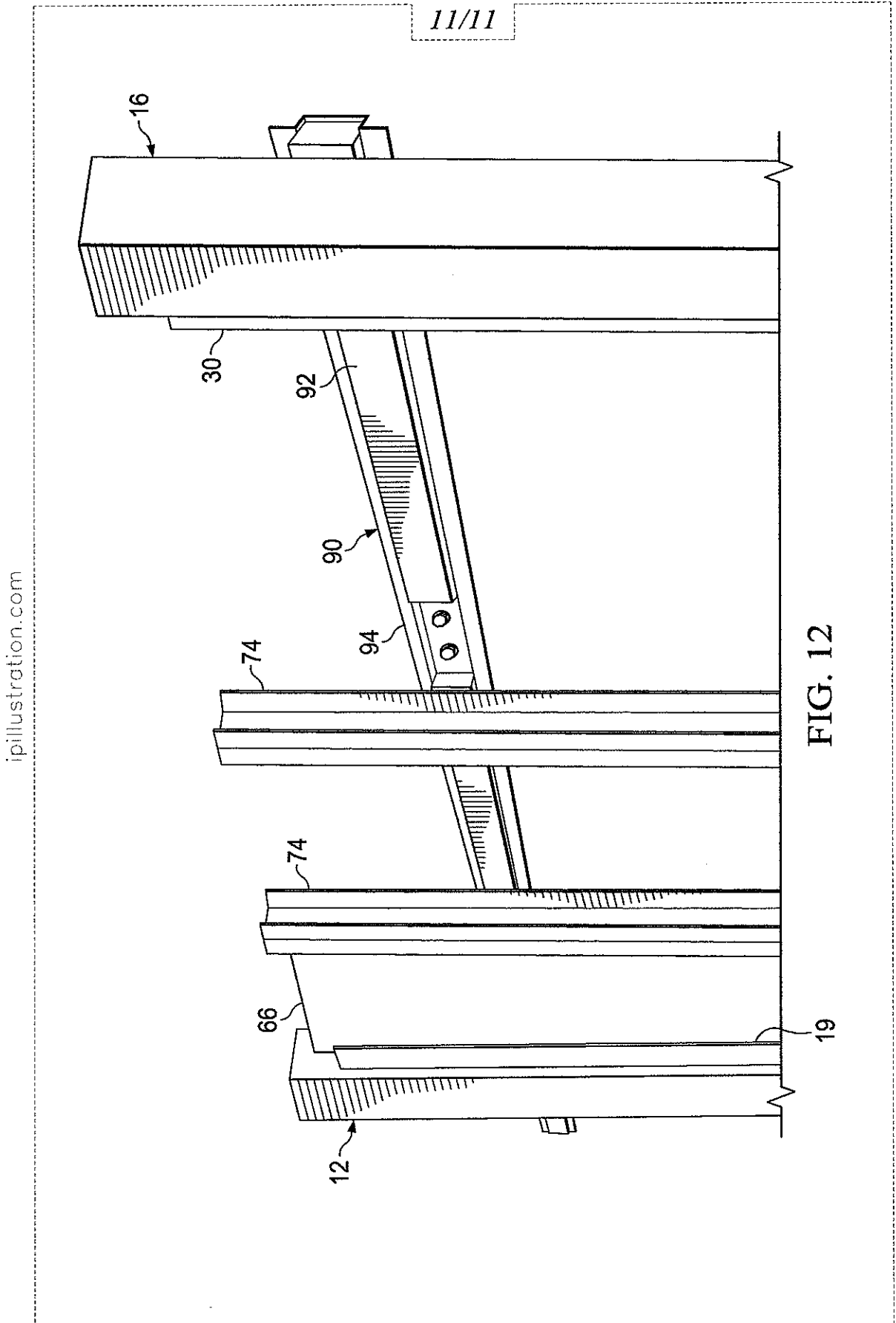
FIG. 11

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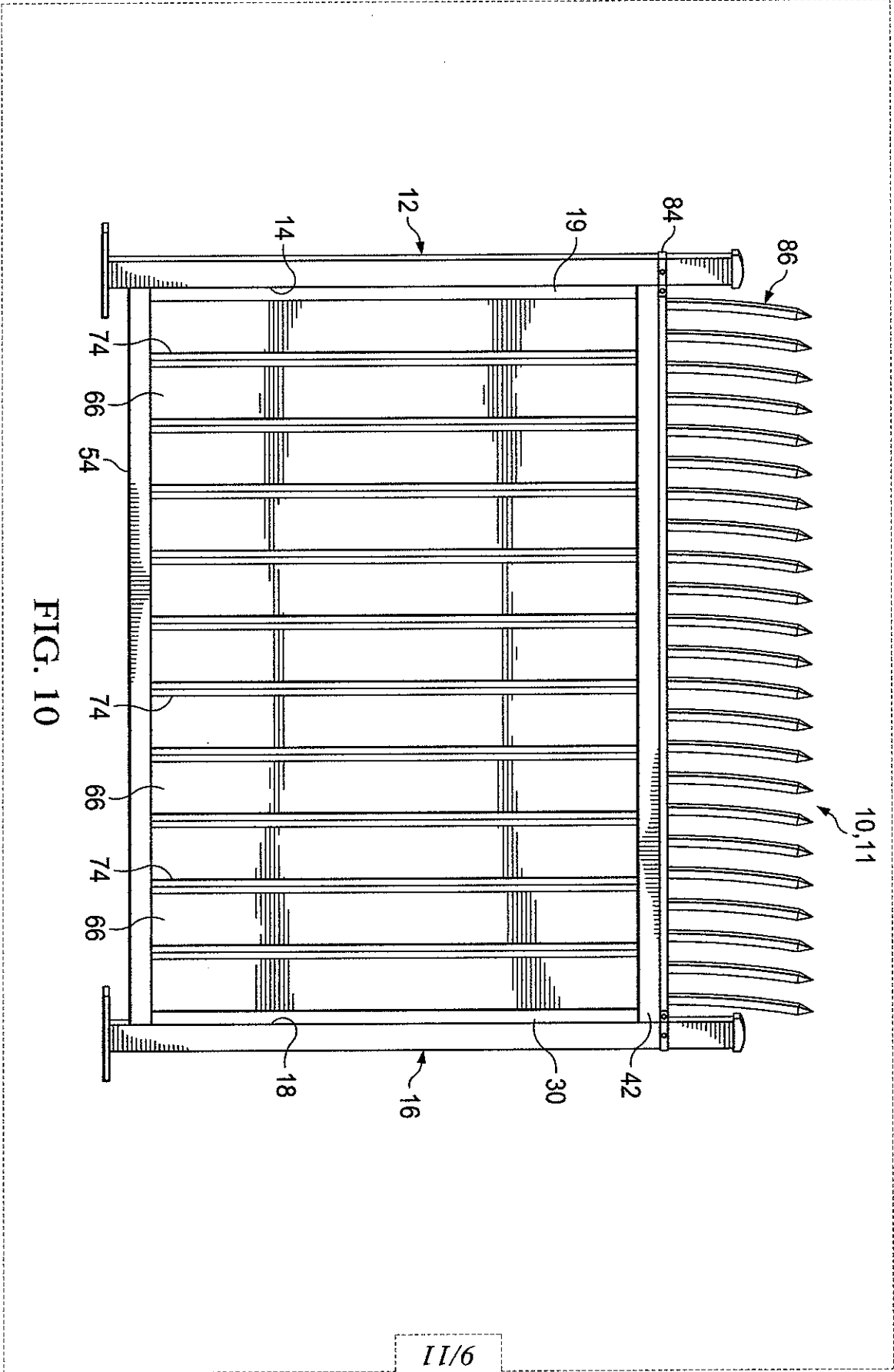
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FIG. 12

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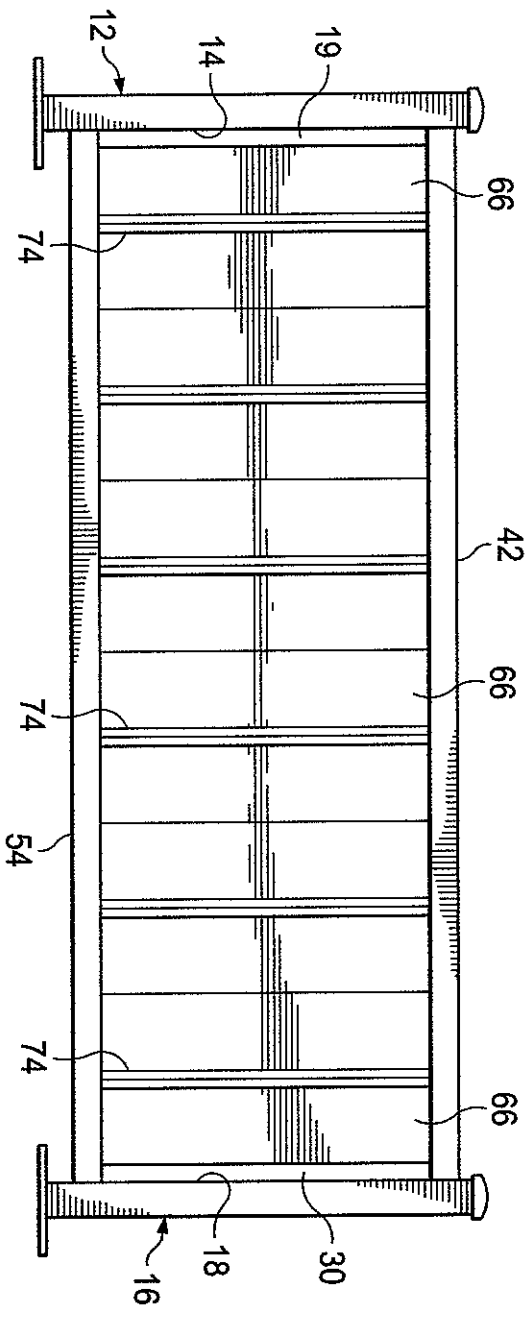


FIG. 9

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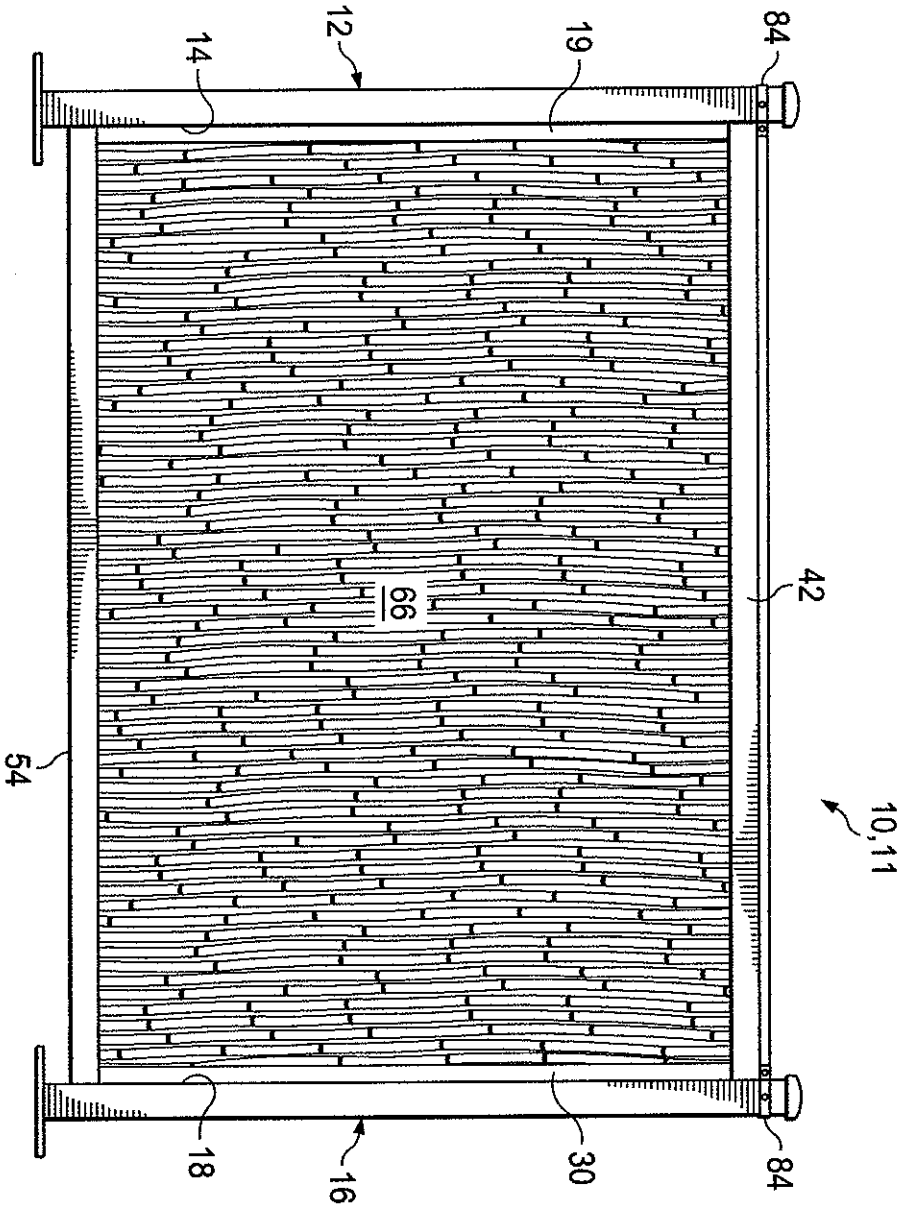


FIG. 8

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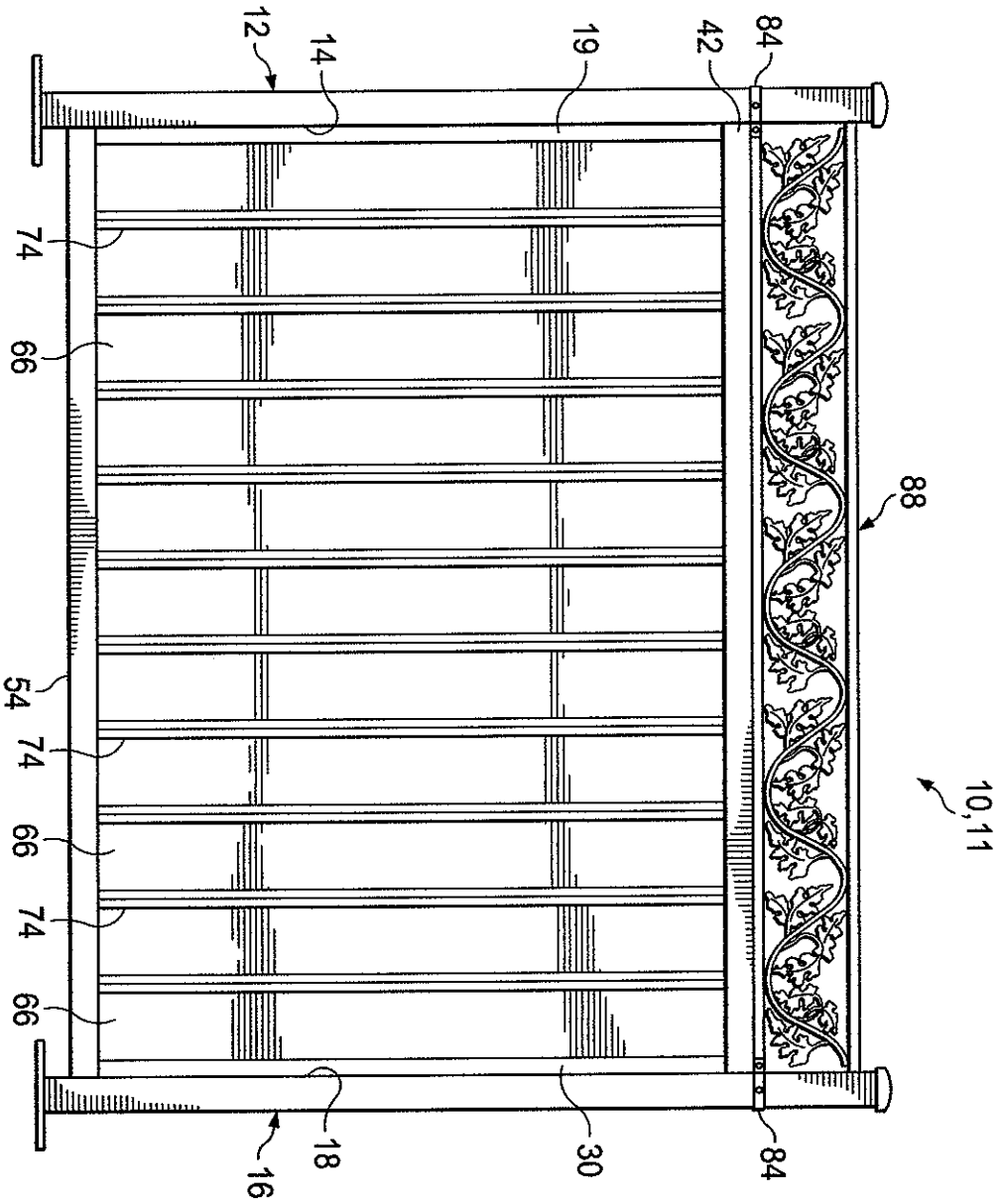


FIG. 7

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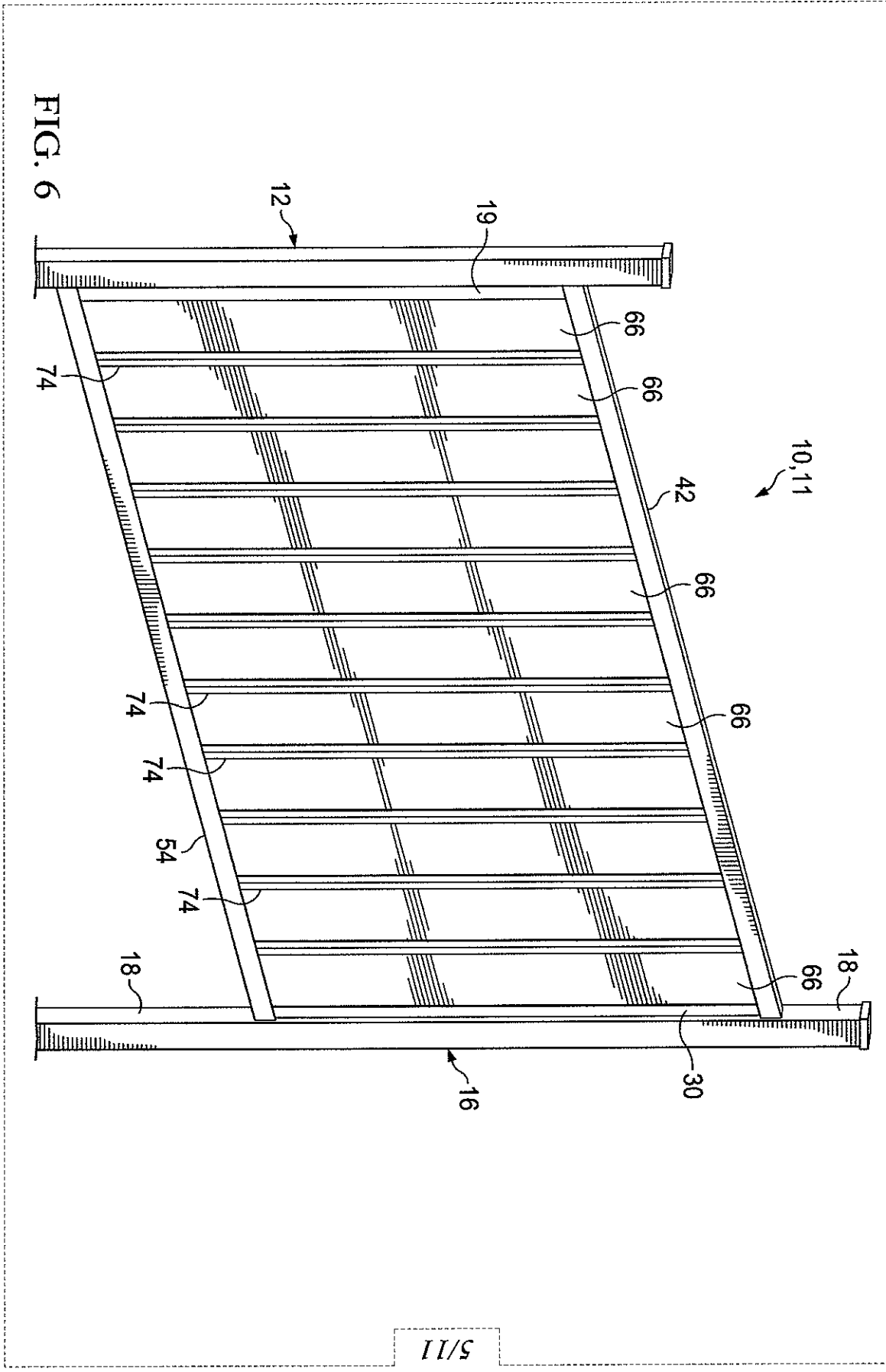


FIG. 6

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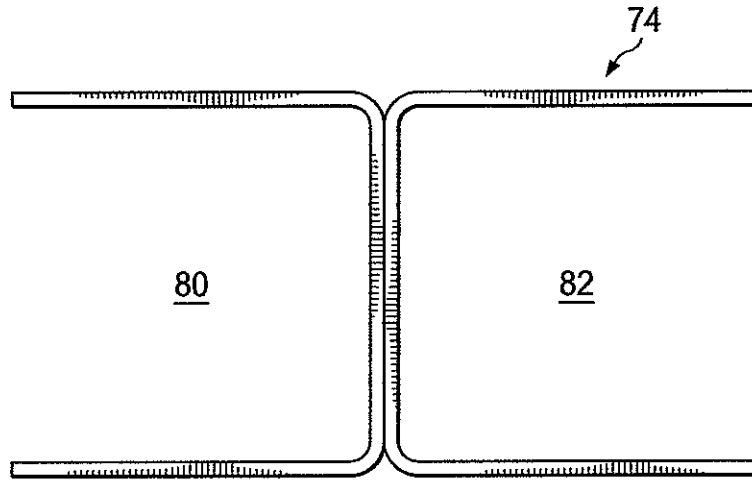


FIG. 4

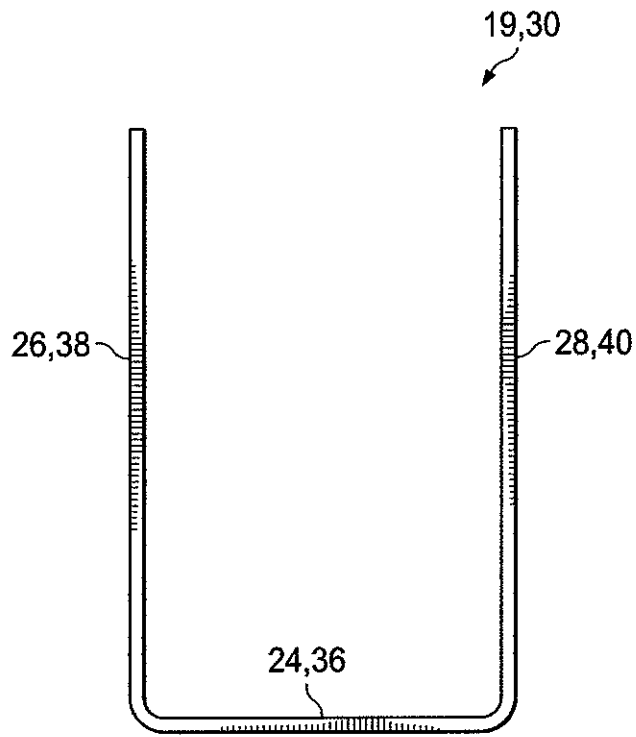
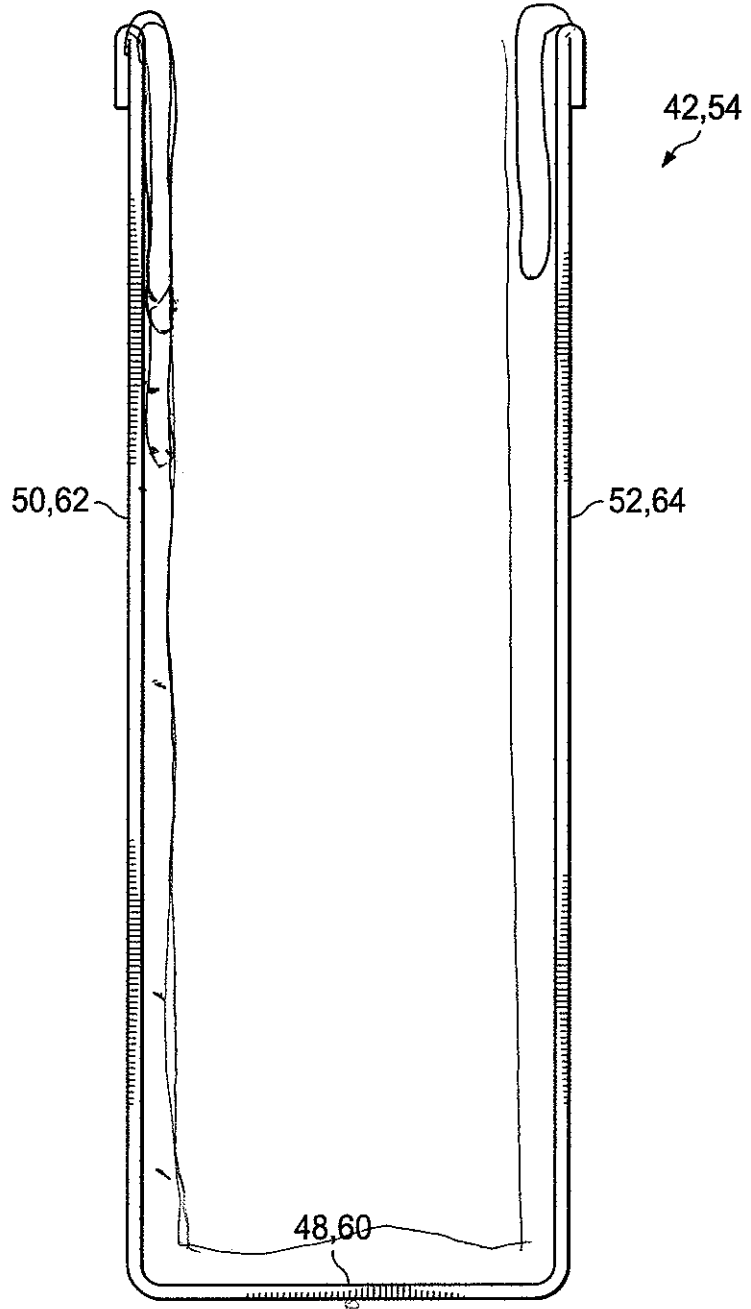


FIG. 5

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FIG. 3

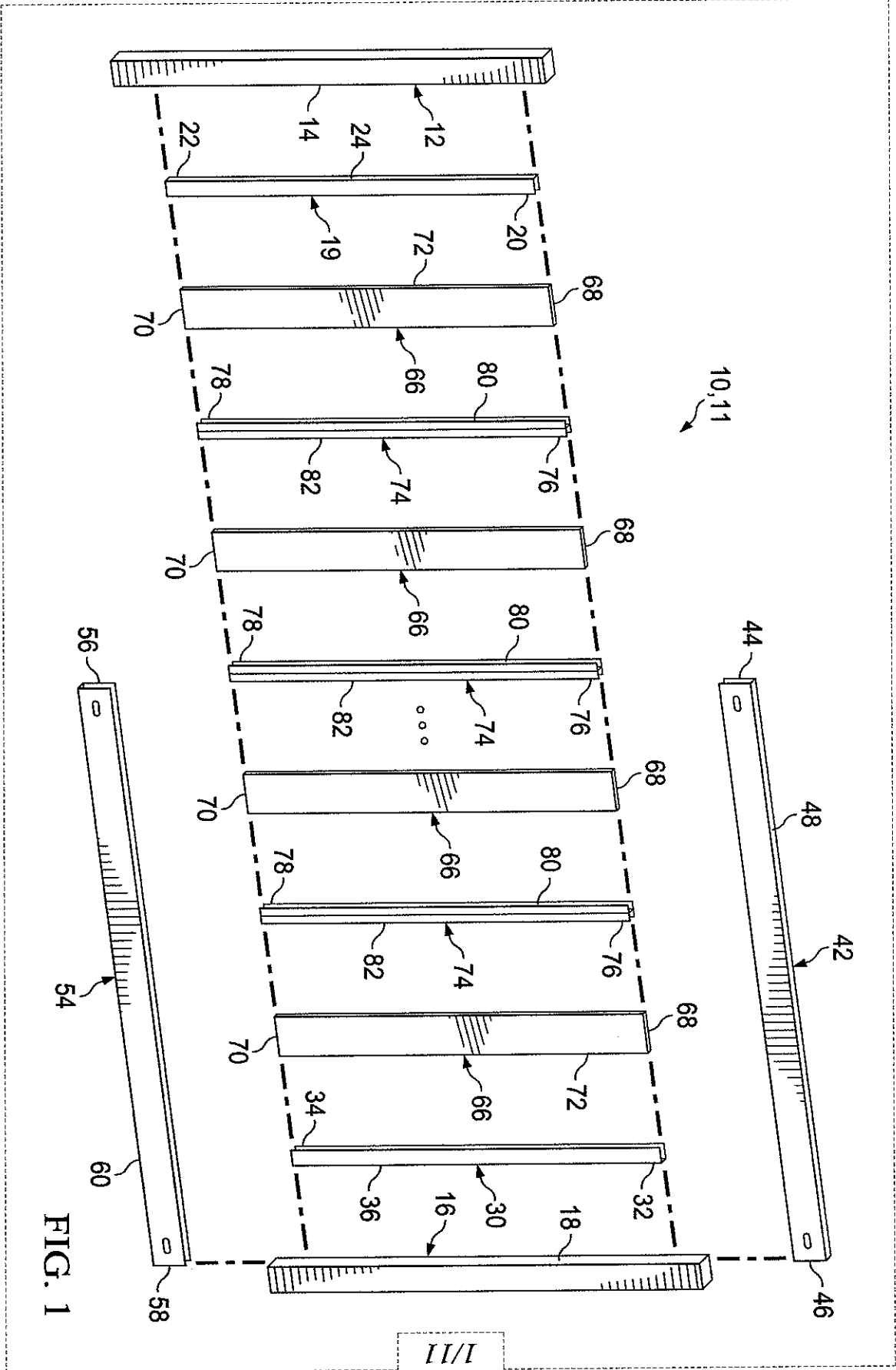


FIG. 1

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