

Clinical Use of the Churro Jumper

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Creekmore recently noted that the easiest task for orthodontists is to align the teeth correctly within the individual jaws.¹ This can be done with or without extractions, with or without favorable growth, and with a minimum of patient cooperation. The difficult task is to correctly position the teeth and jaws anteroposteriorly with proper overbite, overjet, and centric relation. This does require favorable growth, good patient cooperation, and proper treatment planning.

Angle's method of nonextraction treatment depended on two of the earliest strategies for correctly relating the maxilla and mandible and their teeth: headgear and intermaxillary elastics. Without the development of these auxiliaries, his theory of correct occlusion, as determined by the relationship of the permanent first molars with a complete dentition, would have been unattainable and insupportable.

Under Tweed's approach, Angle's permanent first molar goal was achievable with the space provided by extractions.² There has recently been a re-emergence of interest in nonextraction therapy for a variety of reasons – overtreatment of faces with extraction techniques, medicolegal concerns, a resurgence of Angle's theory, a desire for simpler treatment mechanics, and patient resistance to extractions, among others.

Thus, we have seen a resurrection of venerable and almost forgotten techniques, along with the development of entirely new appliances that attempt to favorably alter the anteroposterior relationship of the jaws and occlusion and that also require a minimum of patient cooperation. Apparatuses such as Saif springs,³ the Herbst appliance,⁴ the Pendulum appliance,⁵ the Jasper Jumper,⁶ the Jones Jig,⁷ the Mandibular Protraction Appliance,⁸ the Distal Jet,⁹ and the Eureka Spring¹⁰ are but a few of the mechanisms proposed for this purpose. Such appliances can be categorized in a number of ways (intra-arch or interarch anchorage, dentoalveolar appliances, and orthopedic regulators), but aside from the headgear, which displaces the entire maxilla, and the Pendulum, which separates the palatal suture, most of them have been found to provide primarily dentoalveolar effects along with some temporary bending of the mandible.¹¹ Whether these appliances act dentally or orthopedically may be irrelevant, as long as they contribute efficiently to the correction of malocclusions and clinicians understand their actions well enough to anticipate their effects. One of the features that most of these appliances share, apart from their effectiveness, is their high cost. Many of them require laboratory fabrication, which further adds to their expense. Another disadvantage of most of them is their inability to correct Class III malocclusions.

The Churro Jumper

The Churro Jumper furnishes orthodontists with an effective and inexpensive alternative force system for the anteroposterior correction of Class II and Class III malocclusions. Two years ago, Dr. Castañon accepted a challenge to improve the MPA introduced by Coelho.⁸ The resulting appliance is easily fabricated with materials commonly found in orthodontic offices and does not require any laboratory construction. The name was taken from a Mexican cinnamon twist.

Although the Churro Jumper was conceived as an improvement to the MPA, it functions more like

the Jasper Jumper (Fig. 1). In the Class II mode, each jumper attaches to the maxillary molars by a pin that passes first through a circle on the distal end of the jumper and then through the distal end of the headgear tube. It is secured by bending the pin down on the mesial end of the tube (Fig. 2).

The mesial end of the Churro Jumper is an open circle that is placed over the mandibular archwire, against the canine bracket, and squeezed shut with a How plier (Fig. 3). In its passive form, the Churro Jumper is not flexed. However, when the pin is pulled forward enough to cause the jumper to bow outward toward the cheek, the appliance begins to exert a distal and intrusive force against the maxillary molar and a forward and intrusive force against the mandibular incisors as it attempts to straighten (Fig. 4).

When used as a Class II corrector, the Churro exerts a posterior force on the maxillary arch and an anterior force on the mandibular arch, much like the Jasper Jumper. However, the effects of the Churro on a small group of initial patients differed somewhat from those discovered by Cope and colleagues in a carefully crafted study of the Jasper Jumper.¹² This study found that the Jasper Jumper consistently:

- Displaced the maxilla posteriorly.
- Failed to stimulate mandibular growth, but did rotate the mandible backward.
- Tipped the maxillary molars posteriorly and intruded them.
- Significantly tipped the maxillary incisors posteriorly and extruded them.
- Significantly tipped, extruded, and moved the mandibular molars bodily in an anterior direction.
- Significantly tipped the mandibular incisors anteriorly and intruded them.

There are several plausible reasons for the differing results between the Churro and Jasper jumpers, but before any definitive treatment characteristics can be assigned to the Churro Jumper, a larger and more thorough study will need to be undertaken.

Construction of the Churro Jumper

The Churro Jumper can be fabricated in a number of ways, as long as a series of 15-20 symmetrical and closely placed circles are formed in a wire. The wire size can be .028" to .032". A wire as large as .036" will be too difficult to work with, and anything smaller than .028" will not be strong enough to resist breakage. The .030" wire has proven the most adaptable and useful of all the sizes tried.

The coil can be formed freehand with a bird-beak plier, but this is a slow and laborious task that often results in asymmetrical circles. A turret can be made from a wooden handle, a headed nail, and a headless nail that approximates the thickness of an .040" or .045" wire and acts as a spindle around which the circles can be formed (Fig. 5A). Another effective way to make symmetrical coils is to hold the .040" or .045" spindle in a table-top vise and wind the wire around it (Fig. 5B).

Once the Churro wire has 15-20 circles, and the ends are on the same side and in the same plane, the appliance is removed from the metal shaft, and new wires can be formed until a collection is available for completion.

A small disposable plastic syringe is filled with a mixed polyvinyl impression material (Extrude) that is injected into the lumen of the jumper (Fig. 6). This fills the appliance with a material that does not restrict its flexibility, but prevents the coils from opening and pinching the tongue and cheeks as it functions.

The Churro Jumper as a Class II Force

Since the Churro Jumper requires reciprocal anchorage, an appropriate mandibular archwire is critical for its success in Class II cases. Generally, the largest possible edgewise archwire is the best to use. With an .018" appliance, this will usually be an .018" X .025" archwire, although an .0175" X .025" wire can also be used. Any wire smaller than these invites breakage. Clinicians who use .022" appliances will experience fewer wire fractures with this jumper, because they can use .019" X .025" or even .021" X .025" archwires.

It is important that the ends of the mandibular archwire be annealed and turned down distal to the terminal molars to act as tiebacks that will limit flaring of the mandibular incisors. The size and type of maxillary archwire is not critical; it can be selected solely with regard to the specific maxillary needs of the case. This wire can be tied back or not, depending on whether en masse movement or selected molar displacement is desired.

Because the Churro needs space to slide on the mandibular archwire, at least the first premolar brackets should be omitted. It is usually advantageous to place a buccal offset in the wire just distal to the canine bracket so that the jumper also has buccal clearance, which permits unrestricted sliding along the wire (Fig. 7).

The length of the jumper is determined by the distance from the distal of the mandibular canine bracket to the mesial of the headgear tube on the maxillary molar band, plus 10-12mm (Fig. 8). This measurement is transferred to the Churro Jumper, with the coil closer to the canine bracket than to the headgear tube. A circle is then formed at each termination mark on the Churro wire, so that the coils of the jumper lie against the cheek and the terminal circles face the teeth. The maxillary circle is completely closed, but the mandibular circle is only partially closed to allow its placement over the mandibular archwire and subsequent closure.

A pin made of annealed .036" wire is used to secure the maxillary circle through the distal of the headgear tube. The maxillary pin is pulled mesially through the headgear tube until the jumper has a slight buccal bow in it, and is then turned down (Fig. 9). Initially, the pin is not cinched tightly against the tube, which improves patient comfort and allows space for later adjustments. At subsequent appointments, as the teeth move and adjust to the forces of the Churro Jumper, the headgear pin is pulled forward to reactivate it.

The mandibular circle is placed over the mandibular archwire against the canine bracket. The force of the Churro is so light that canine brackets are seldom broken.

The Churro Jumper usually requires no more than four to six months to correct a Class II malocclusion, but for insurance, should be left in place until the bicuspid present a firm Class I occlusion. Several authors have maintained that a firm occlusion of sharply cusped teeth is the servomechanism responsible for occlusal stability.^{4,13,14}

Unlike some Class II appliances, the Churro Jumper can be used unilaterally, which makes it ideal for correcting a Class II subdivision malocclusion (Fig. 10A, 10B, 10C, 10D). It is more comfortable and easier for the patient to adapt to a unilaterally applied than a bilaterally applied force. The unilateral Churro allows wider mouth opening and a greater range of mandibular motion than a bilateral appliance.

The bilateral Class II Churro Jumper is most suitable for patients who need mandibular incisor

advancement, since the appliance depends on a mesially directed mandibular force that typically relocates the mandibular incisors more anteriorly. Therefore, the Churro Jumper is a poor choice for treating a bimaxillary Class II malocclusion where the mandibular incisors are already too far forward in the face, but is a good choice for treating a Class II malocclusion with mandibular incisors that are too lingual (Fig. 11A, 11B, 11C, 11D).

Anchorage is enhanced by the Churro Jumper through its primary force vectors, which push against the mesial of the maxillary molar and the distal of the mandibular canine. These forces prevent the maxillary molar from moving forward into the extraction space while simultaneously limiting the distal movement of the mandibular canine. Using sectional arches, the mandibular molar can be moved mesially to correct the molar malocclusion, while the maxillary canine is moved distally to effect a Class I canine relationship (Fig. 12).

Without a constantly applied Class II force, maxillary anchorage is lost, and the maxillary molar moves forward while the mandibular canine moves too far distally. Ultimately, the extraction space will close without correction of the posterior occlusion, and subsequent efforts to resolve the anteroposterior discrepancy will be much more difficult and less satisfactory than if it had been done while ample space existed for the correction (Fig. 13A, 13B, 13C, 13D).

The Churro Jumper as a Class III Force

The Churro Jumper, unlike many other Class II appliances, can be adapted to provide a well-designed force for correction of Class III malocclusions. In the Class III version, the terminal circles are placed against the mesial of the mandibular molar tube and the distal of the maxillary canine bracket. Ordinarily, the distance between the maxillary canine and first premolar brackets is enough to allow the jumper to open adequately and slide easily. If there is any restriction, however, the premolar bracket can be removed. Although the anterior (maxillary) circle can extend in a straight line from the shaft of the jumper, it is preferable to add a vertical bend that converts the Churro Jumper's force into a Class I vector, which produces less vertical thrust, incisor flaring, and anterior bite opening (Fig. 14). This vertical bend also allows the Churro to lie unobtrusively in the mandibular vestibule, making it less noticeable and bothersome for the patient.

The Churro Jumper can improve the effectiveness of orthodontic therapy in Class III patients who refuse to wear Class III elastics (Fig. 15A, 15B, 15C, 15D, 15E).

Conclusion

The Churro Jumper has several disadvantages that sometimes limit its usefulness:

- The restriction of mouth opening to 30-40mm is intolerable for some patients.
- Archwire breakage is common if larger wires are not used.
- Patients with a low tolerance for discomfort will often break the appliance (as well as the spirit of the orthodontist).
- Patients who incessantly move their mouths with chewing, talking, and nervous tics will fare poorly with it.
- Its maximum effectiveness depends on a permanent dentition to retain its effect.
- Presently, it must be manufactured in the office.

Nevertheless, the Churro Jumper has considerable advantages:

- It provides a constant, indefatigable force that cannot be removed from the mouth. It can be used either unilaterally or bilaterally.
- It can be used to correct Class II or Class III malocclusions.
- It helps maintain anchorage, since it prevents the maxillary molars and mandibular incisors from moving into extraction sites.
- The cost of construction for materials and labor is less than \$1.
- It can be made as needed, from materials already present in most orthodontic offices, and does not require an expensive inventory.
- It is universal in size and can be adapted to fit any malocclusion.
- When broken, it is easily and inexpensively removed and replaced.
- Staff members can quickly learn how to replace an appliance.

Whereas most therapies require an investment of hundreds or even thousands of dollars, the Churro can be fabricated with a minimum of time, effort, expertise, and expense. No appliance is universally applicable, but if clinicians are willing to undergo a learning curve, the Churro Jumper can provide them with a potent, versatile appliance for correcting a variety of malocclusions. □

FIGURES



Fig. 1 Churro Jumper without its terminal circles.

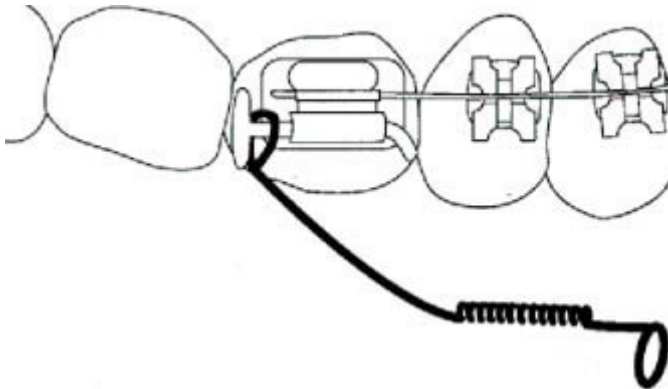


Fig. 2 Distal circle of Churro Jumper attached to headgear tube.

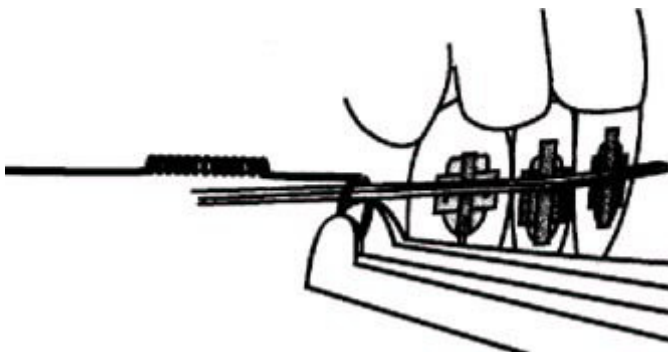


Fig. 3 Mesial circle of Churro Jumper attached to mandibular archwire by squeezing it shut.

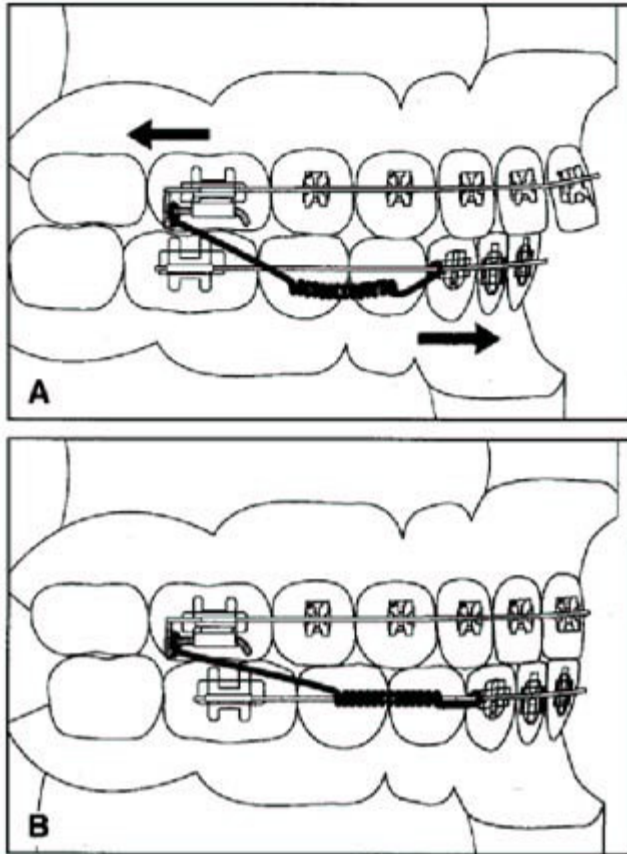


Fig. 4 A. Churro Jumper bows outward with activation, exerting force distally against maxillary molar and mesially against mandibular arch. B. In several months, Churro Jumper corrects Class II malocclusion and returns to passive state.

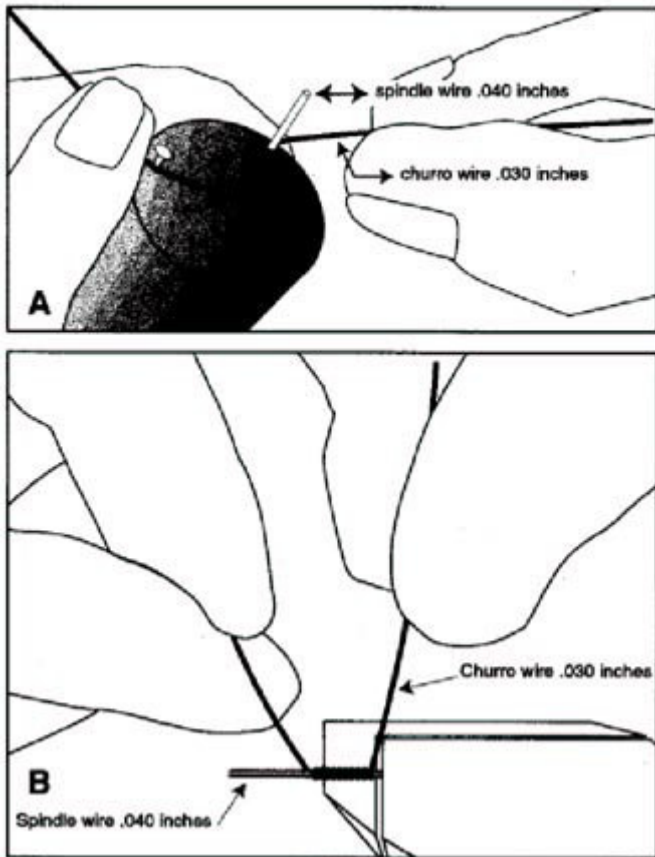


Fig. 5 A. Turet made from large wooden dowel, small nail, and spindle. B. Spindle held by bench vise.

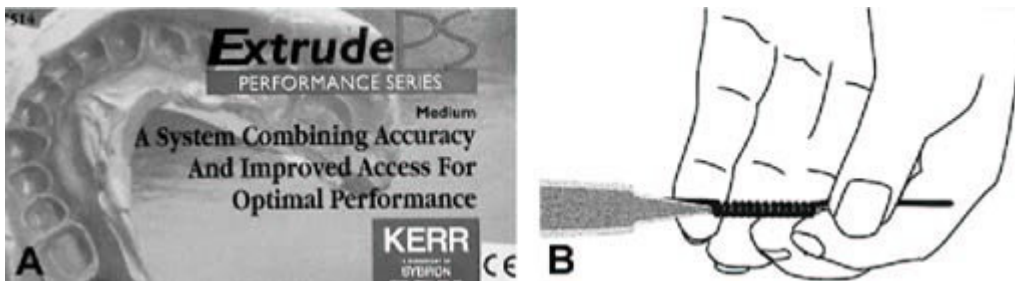


Fig. 6 A. Extrude polyvinyl impression material. B. Plastic syringe used to fill lumen of Churro Jumper.

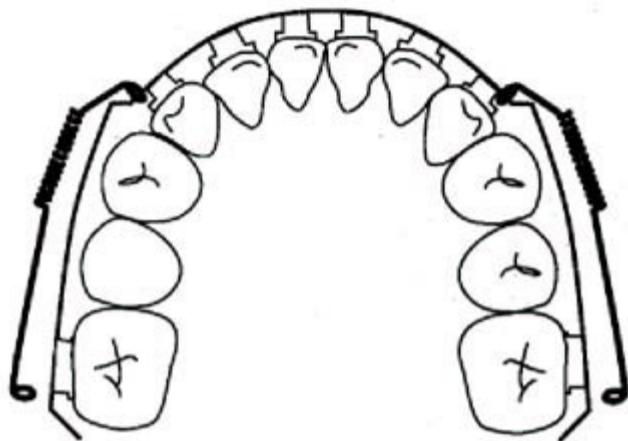


Fig. 7 Omission of bicuspid brackets and offsets distal to canine brackets allow Churro Jumper to slide freely on mandibular archwire. Note turndowns distal to terminal molar tubes.

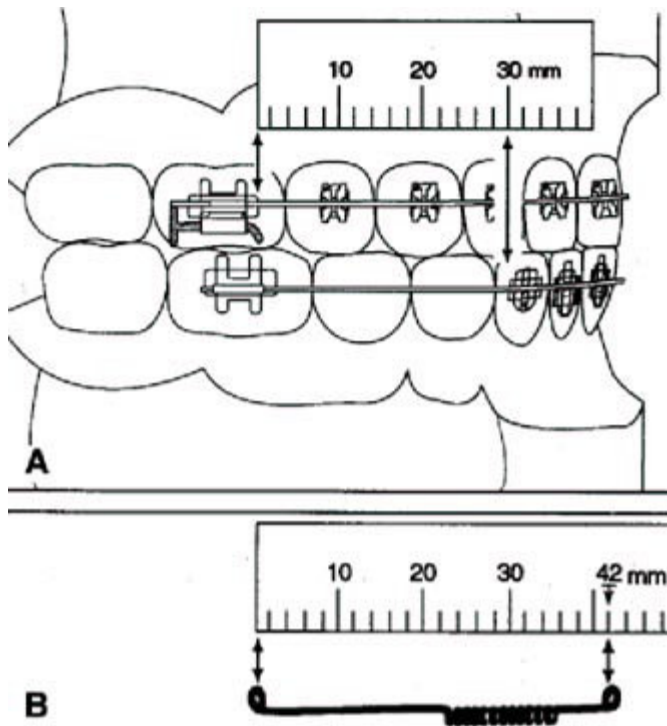


Fig. 8 A. Measurement from mesial of maxillary headgear tube to distal of mandibular cuspid bracket. B. Proper length of Churro Jumper after adding 12mm to measurement and forming terminal circles.

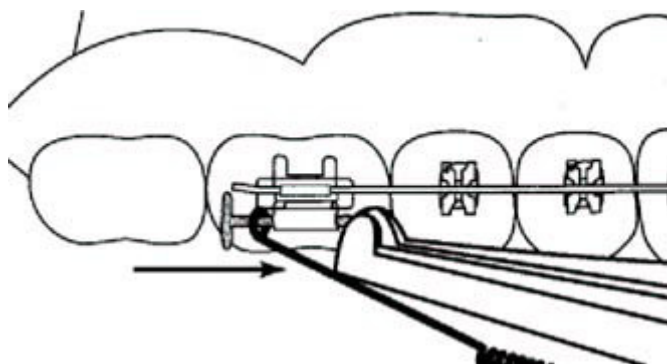


Fig. 9 Maxillary pin activated by pulling it forward and turning it down. Pin initially is not cinched tightly to improve patient comfort and allow future activations.

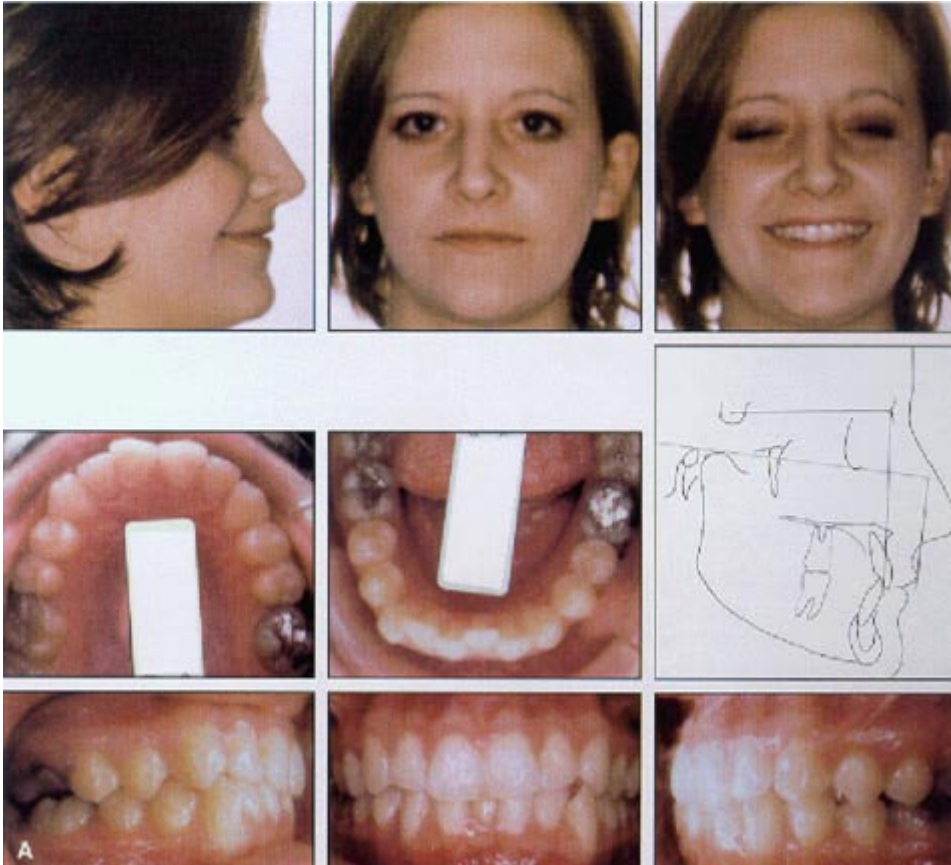


Fig. 10 A. 19-year-old female with Class II subdivision malocclusion.



Fig. 10b Unilateral Churro Jumper in place.

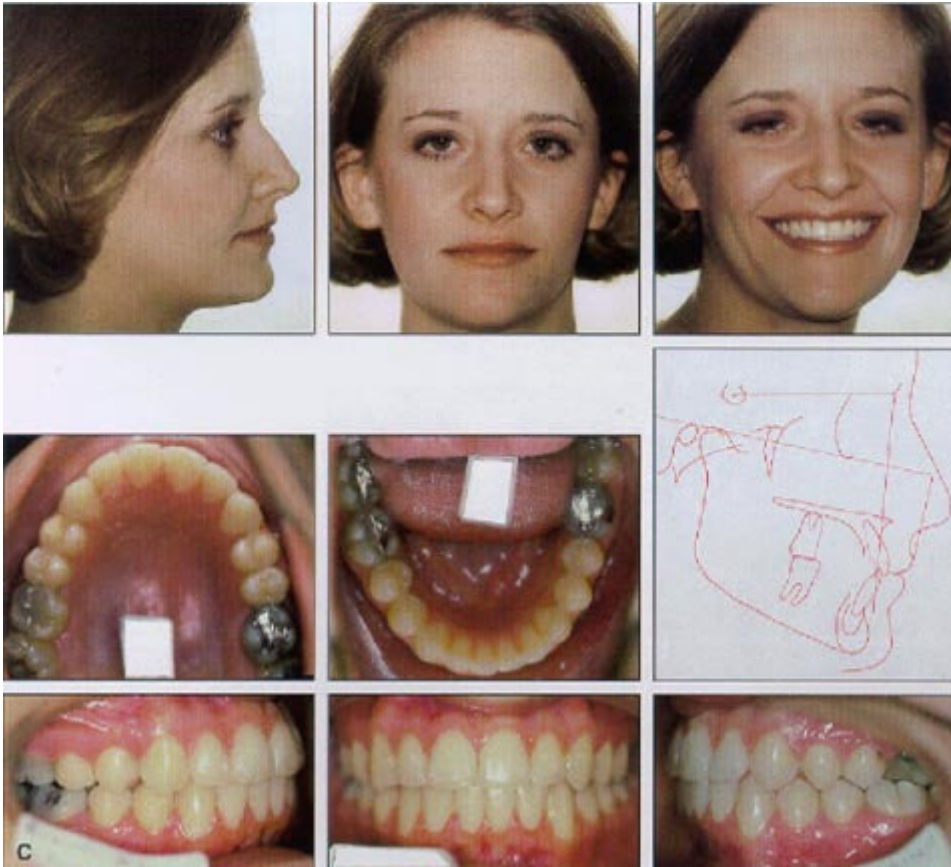


Fig. 10c After 23 months of treatment.

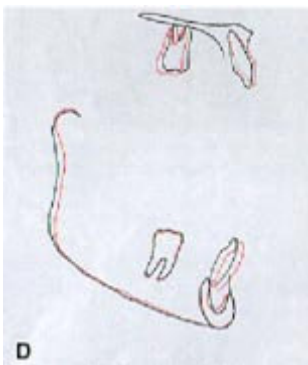


Fig. 10d Superimposition of pre- and post-treatment cephalometric tracings.

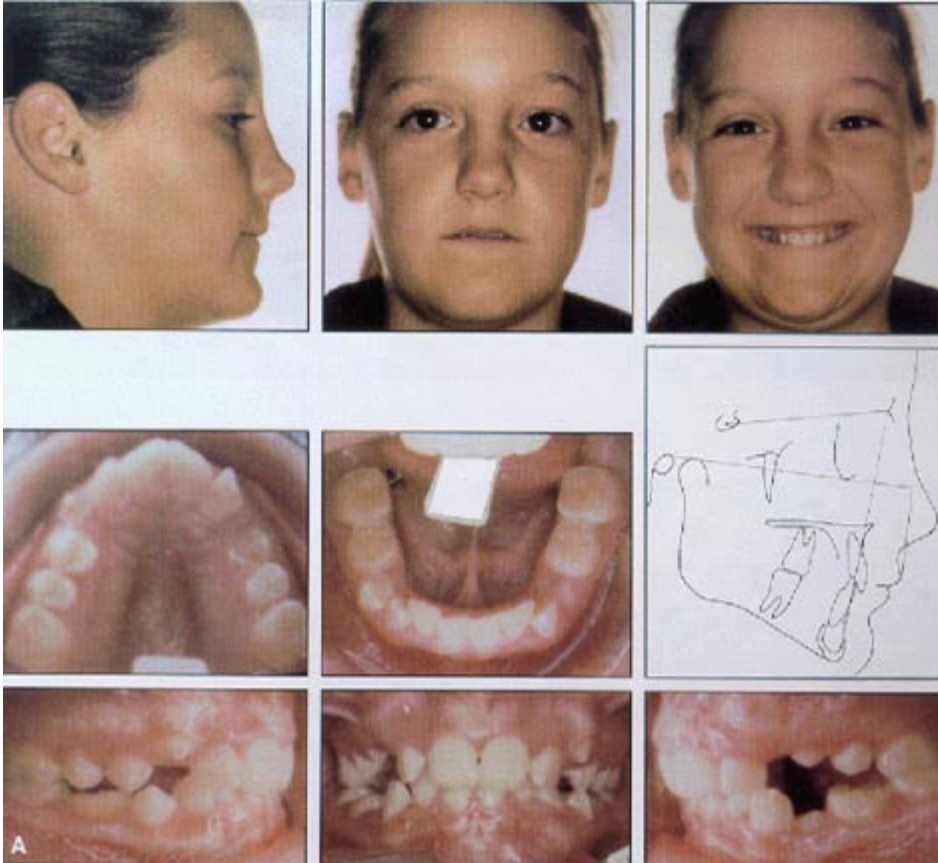


Fig. 11a 11-year-old female Class II patient with mandibular incisors lingual to NA line.



Fig. 11b Bilateral Churro Jumper in place.

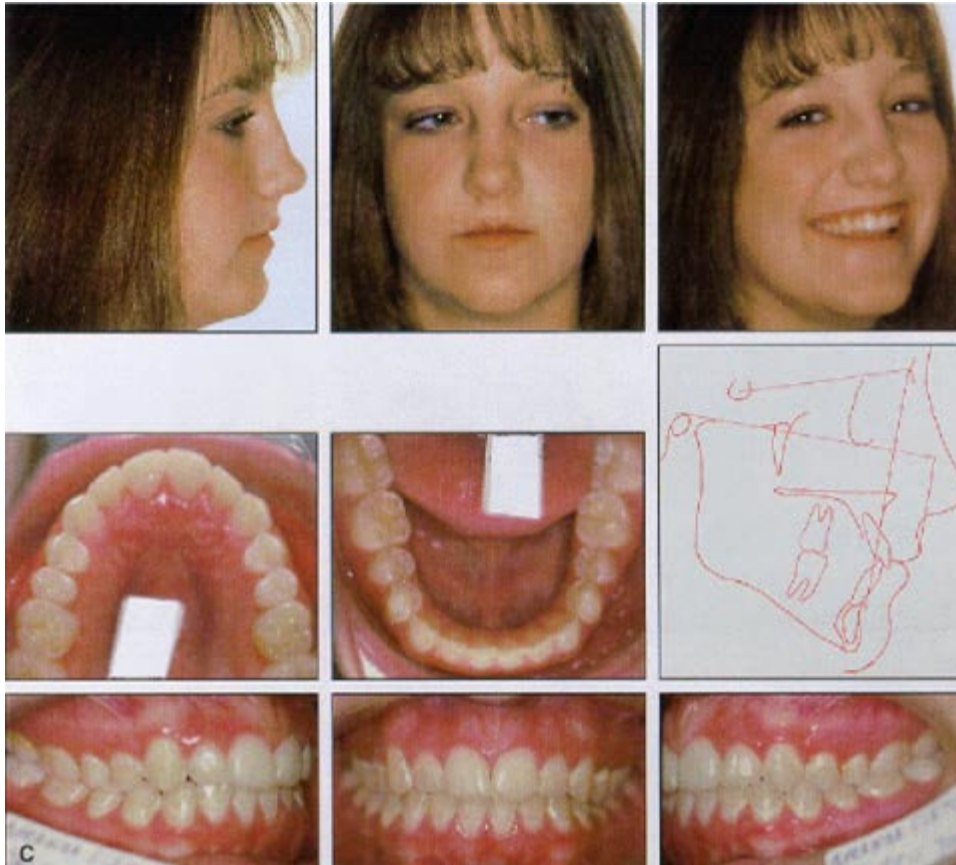


Fig. 11c After 34 months of treatment.



Fig. 11d Superimposition of pre- and post-treatment cephalometric tracings. Forward movement of mandibular incisors improved interincisal relationship as well as facial profile.



Fig. 12 Class II Churro Jumper with sectional arches. Mandibular molars are moved mesially to correct molar relationship, while maxillary canines are moved distally to correct canine relationship.

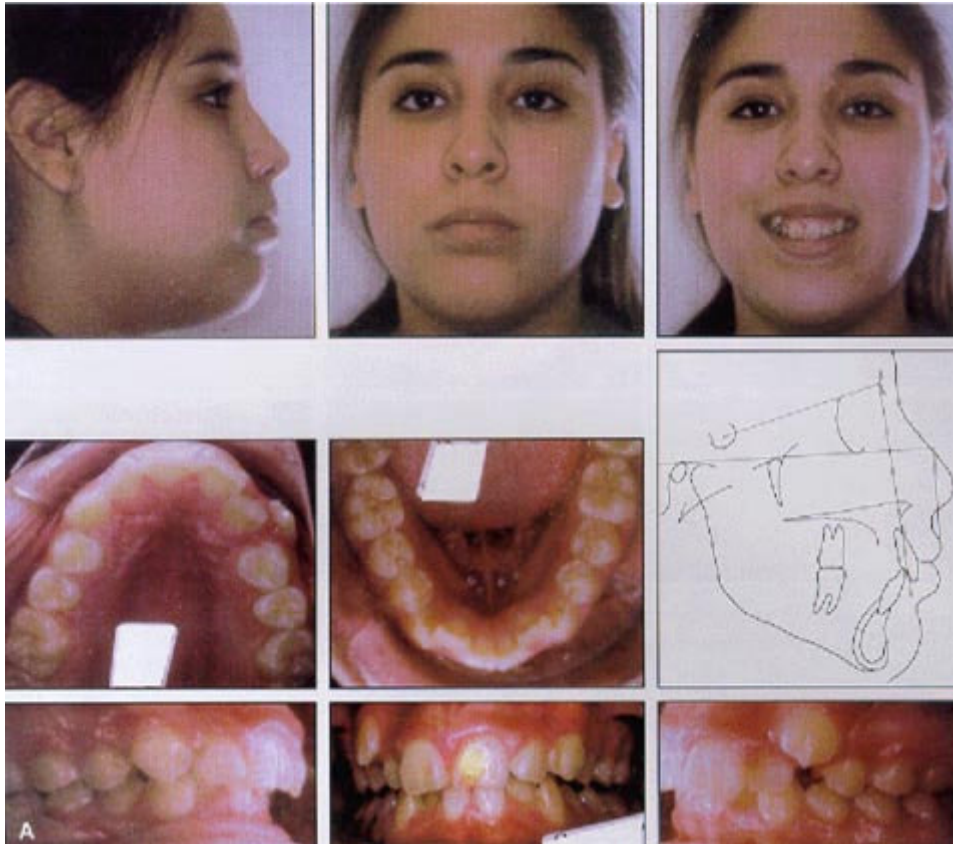


Fig. 13a 14-year-old female before treatment.



Fig. 13b Churro Jumpers used bilaterally to preserve maxillary molar anchorage and prevent excessive lingual movement of mandibular incisors.

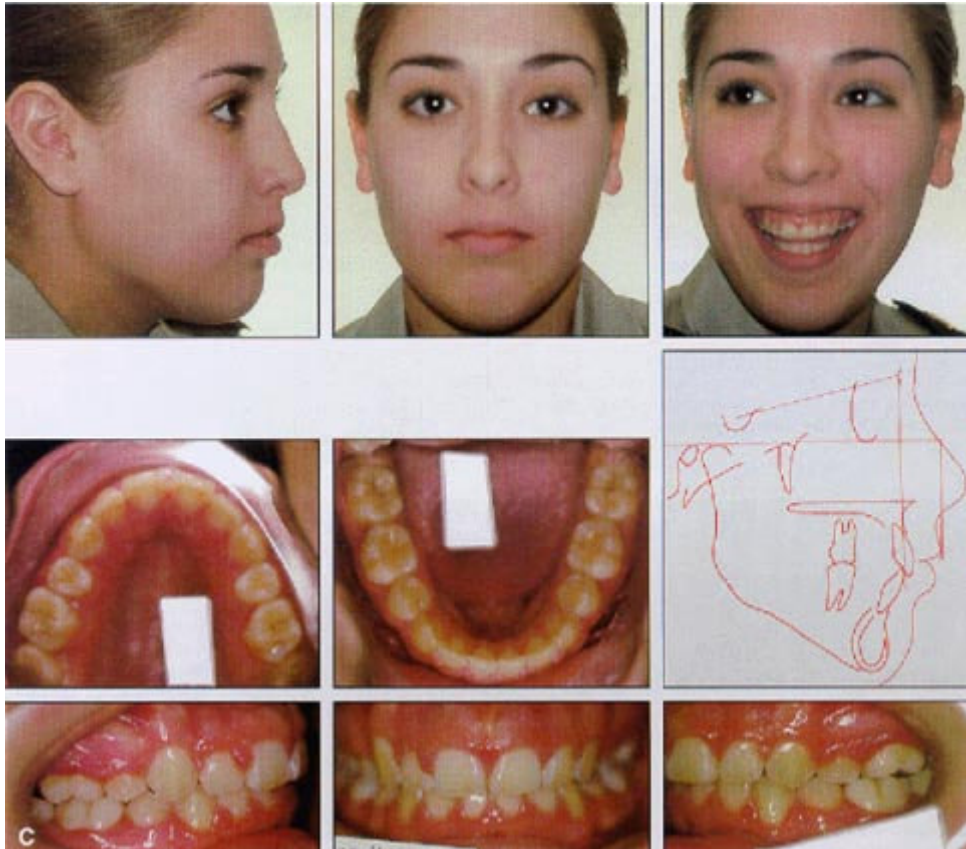


Fig. 13c After 32 months of treatment.

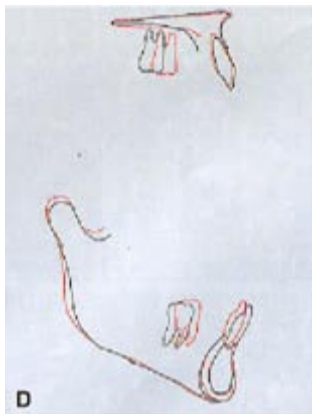


Fig. 13d Superimposition of pre- and post-treatment cephalometric tracings.

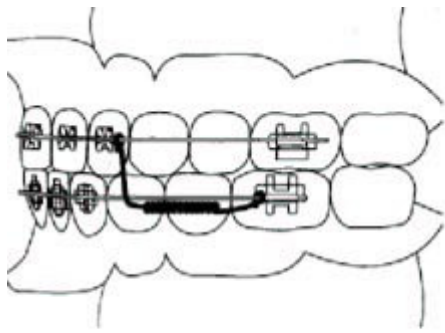


Fig. 14 Class III Churro Jumper with vertical bend placed on mesial end, eliminating vertical vector that would open the bite anteriorly.

Fig. 14 Class III Churro Jumper with vertical bend placed on mesial end, eliminating vertical vector that would open the bite anteriorly.

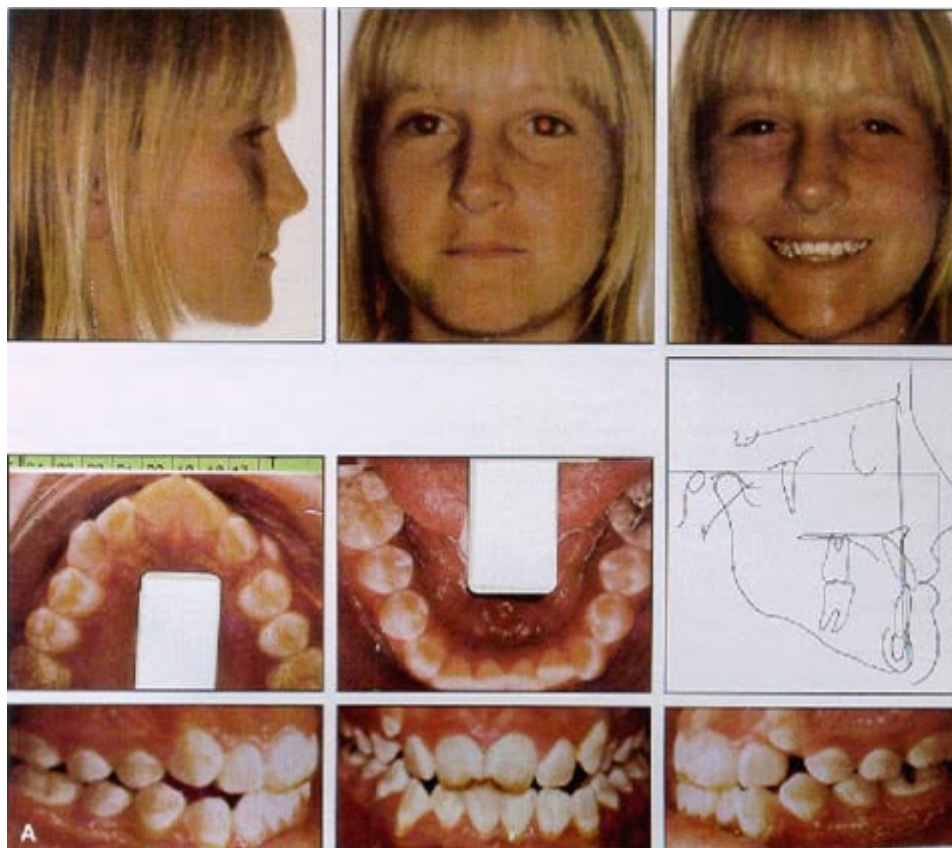


Fig. 15a 10-year-old female patient before treatment (continued on next page).



Fig. 15b Initial appliance. Class III malocclusion did not fully express itself clinically until rotations were removed and occlusion leveled.



Fig. 15c Class III Churro Jumper in place.

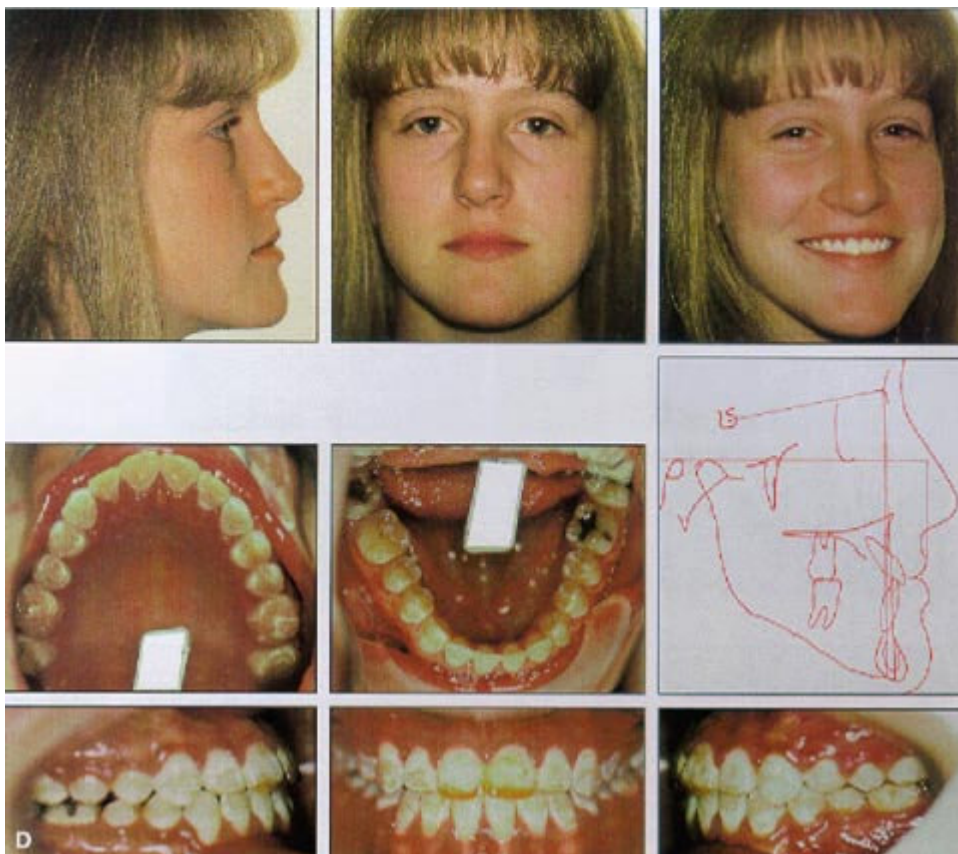


Fig. 15d After 38 months of treatment.

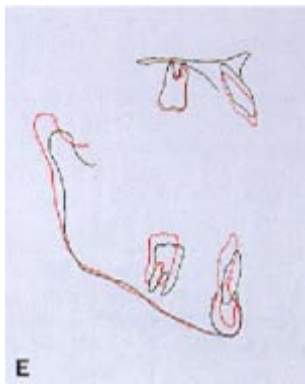


Fig. 15e Superimposition of pre- and post-treatment cephalometric tracings.

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FOOTNOTES

1 Saif springs: Pacific Coast Manufacturing, Inc., 18506 142nd Ave. N.E., Woodinville, WA 98072.

2 Herbst: Registered trademark of Dentaaurum, Inc., 10 Pheasant Run, Newtown, PA 18940.

3 Pendulum: Ormco A Company, 1717 W. Collins Ave., Orange, CA 92867.

4 Jasper Jumper: American Orthodontics, 1714 Cambridge Ave., Sheboygan, WI 53082.

5 Jones Jig: American Orthodontics, 1714 Cambridge Ave., Sheboygan, WI 53082.

6 Eureka Spring: 1312 Garden St., San Luis Obispo, CA 93401.

7 Extrude: Kerr, 1717 W. Collins Ave., Orange, CA 92867.