Acrylic baseplate

Self-cure or heat-cure acrylic.

Heat-curing of polymethylmethacrylate increases the degree of polymerization of the material and optimizes its properties, but is technically more demanding to produce.

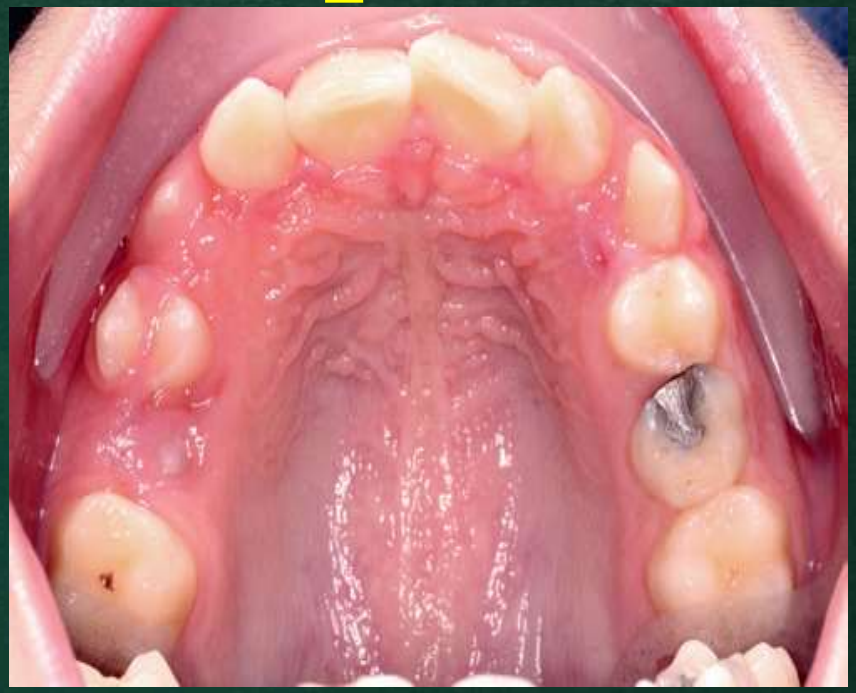
Acrylic baseplate

It is common practice to make the majority of appliances in self-cure acrylic, retaining heat-cure acrylic for those situations where additional strength is desirable, for example some functional appliances.

Modifications of acrylic base plate

1. Flat anterior bite plane → Separate teeth posteriorly
2. Inclined bite plane → Separate teeth posteriorly
3. Posterior bite plane → Separate teeth anteriorly

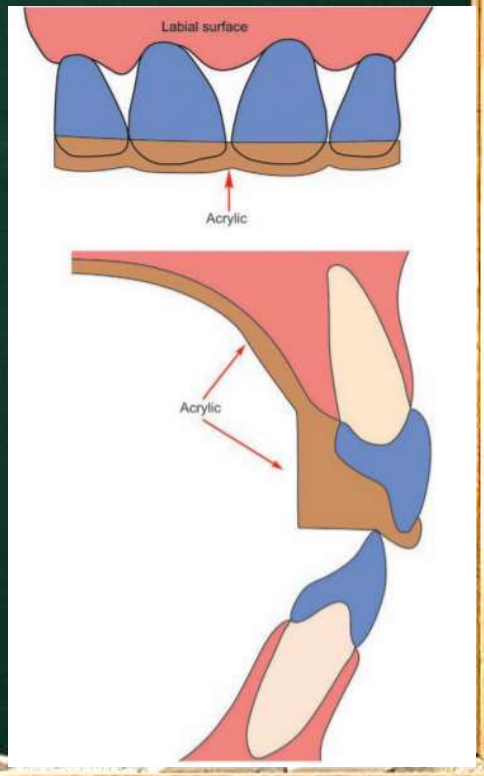
Acrylic baseplate



This patient has an obvious deep bite, with (A) severe overbite to the palatal tissue adjacent to the and (B), resulting damage maxillary incisors.

Anterior bite-plane:

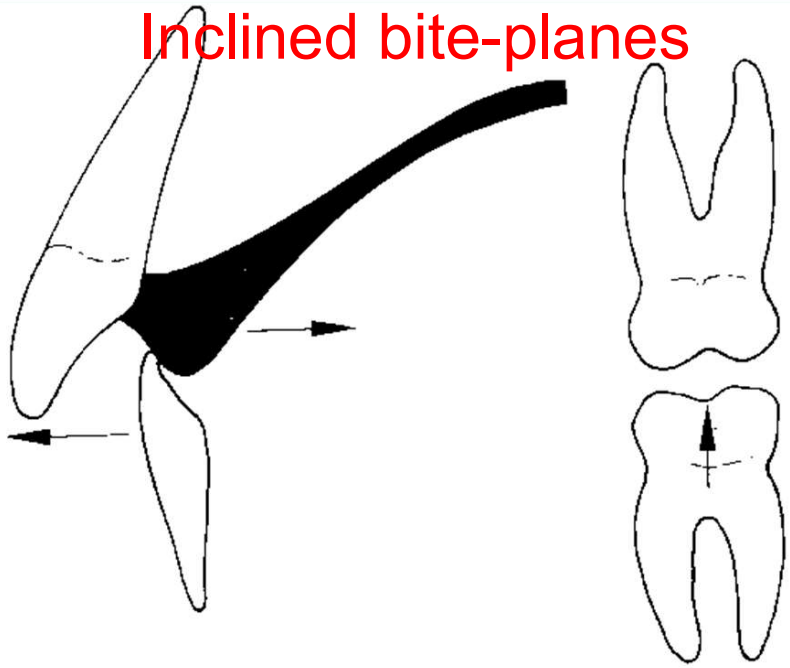
Increasing the thickness of acrylic behind the upper incisors forms a bite-plane onto which the lower incisors occlude. A bite-plane is prescribed when either the overbite needs to be reduced by eruption of the lower buccal segment teeth or elimination of possible occlusal interferences is necessary to allow tooth movement to occur.

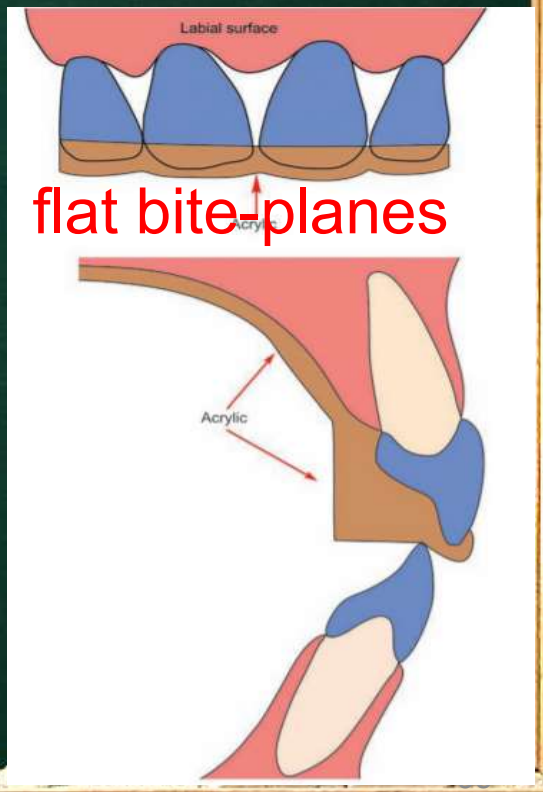


Anterior bite-plane:

Anterior bite-planes are usually flat. Inclined bite-planes may lead to proclination or retroclination of the lower incisors, depending upon their angulation.

Inclined bite-planes





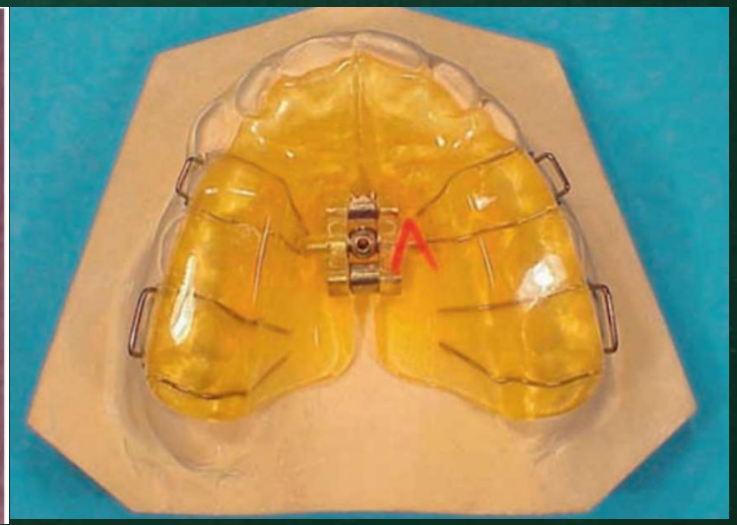
flat bite-planes

When prescribing a flat anterior bite-plane the following information needs to be given to the technician:

In a proportion of cases more than 1–2 mm of overbite reduction is required, and therefore it will be necessary to make additions to the depth of the bite-plane during treatment.

Buccal capping

Buccal capping is prescribed when occlusal interferences need to be eliminated to allow tooth movement to be accomplished. Buccal capping is produced by carrying the acrylic over the occlusal surface of the buccal segment teeth and has the effect of propping the incisors apart.



The acrylic should be as thin as practicably possible to aid patient tolerance. During treatment it is not uncommon for the capping to fracture and it is wise to warn patients of this, advising them to return if a sharp edge results. However, if as a result a tooth is left free of the acrylic and is liable to over-erupt, a new appliance will be necessary (as additions to buccal capping are rarely successful).

Anchorage

Maxillary removable appliance utilizing palatal surface for anchorage. Adam's Clasps around molars to assist in retention of the appliance and anchorage reinforcement.

Commonly used removable orthodontic appliances

To correct anterior crossbite in mixed dentition. Movement labially of upper incisors in the mixed dentition can be accomplished either using a spring or screw design depending upon the number of incisors to be moved. To move a single incisobuccally a Z-spring is commonly used. This design is also known as a double-cantilever spring when it is used for moving more than one tooth. Good anterior retention is required to resist the displacing effect of this spring

Designing removable appliances

General principles

The design of an appliance should never be delegated to a laboratory as they are only able to utilize the information provided by the plaster casts.

Success depends upon designing an appliance that is easy for the patient to insert and wear, and is relevant to the occlusal aims of treatment

Steps in designing a removable appliance

Four components need to be considered for every removable appliance:

- Active component(s)
- Retaining the appliance
- Anchorage
- Baseplate

Generally, extractions should be deferred until after an appliance is fitted. The rationale for this is two-fold:

(1) If the extractions are carried out first, there is a real risk that the teeth posterior to the extraction site will drift forward, resulting in an appliance that does not fit well or even does not fit at all.

(2) Occasionally a patient decides after an appliance is fitted that they do not wish to continue wearing it and therefore decide against continuing with treatment. It is obviously preferable if this change of mind occurs before any extractions have been undertaken.

Rarely, it is necessary to carry out extractions first, for example when a displaced tooth will interfere with the design of the appliance. However, even in these cases it is preferable to take impressions for the fabrication of the appliance before the extractions and to instruct the technician to remove the tooth concerned from the model. The appliance should then be fitted as soon as practicable after the tooth, or teeth are extracted.

Advantages & Disadvantages of R.O.A

Advantages	Disadvantages
Can be removed for tooth-brushing	**Appliance can be left out**
Palatal coverage increases anchorage	Only tilting movements possible
Easy to adjust	Good technician required
Less risk of iatrogenic damage (e.g. root resorption) than with fixed appliances	Affects speech
Acrylic can be thickened to form flat anterior bite-plane or buccal capping	Intermaxillary traction not practicable
Useful as passive retainer or space maintainer	Lower removable appliances are difficult to tolerate
Can be used to transmit forces to blocks of teeth	Not efficient for multiple individual tooth movements at the same time

Lower removable appliances are generally less well tolerated by patients. This is due in part to their encroachment upon tongue space, but also the lingual tilt of the lower molars makes retentive clasping difficult.

Although less likely to cause iatrogenic damage, for example, root resorption or decalcification, removable appliances can be detrimental to the patient if used inappropriately.

Skill is required to judge the situations where their use is applicable and to carry out tooth movement effectively.

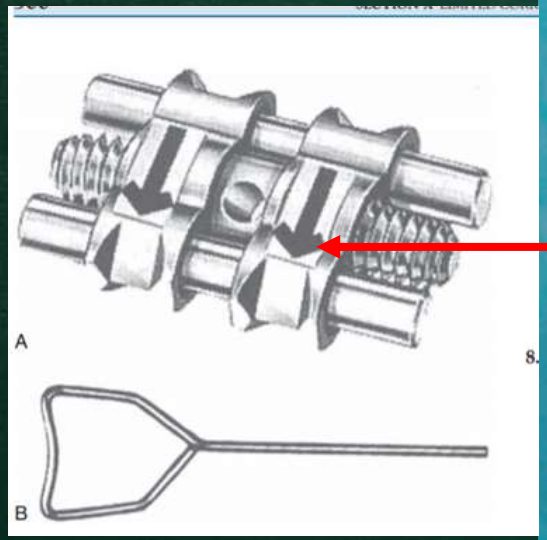
Commonly used removable appliances

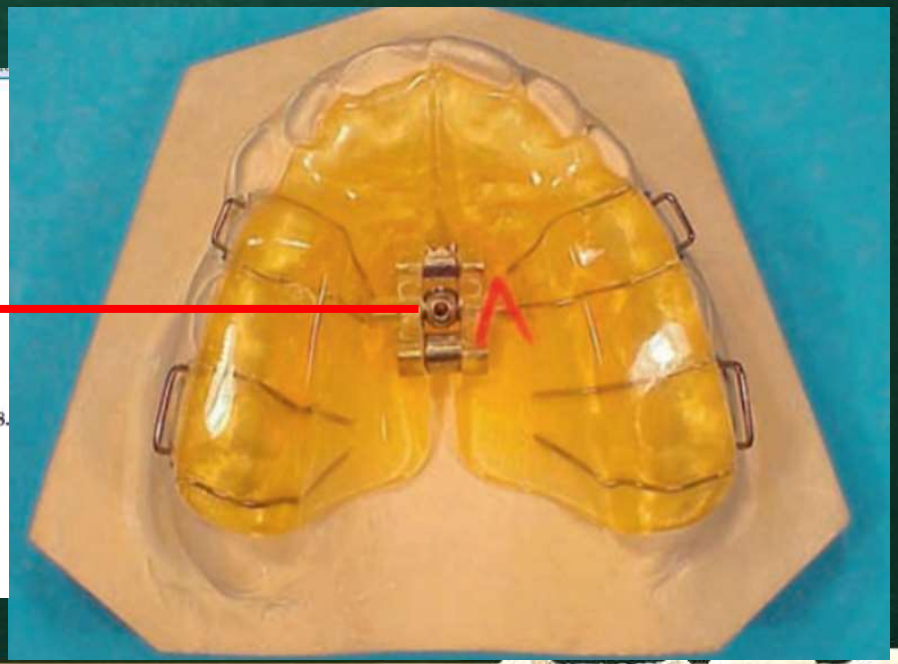
1- A screw design is often used where three or all of the upper incisor need to be moved labially as then the teeth to be moved can be used for retention of the appliance. However the disadvantage is that this results in a much bulkier appliance anteriorly.

Buccal capping is usually incorporated into this appliance to free the occlusion with the lower arch.

2- Screw appliance to expand upper arch

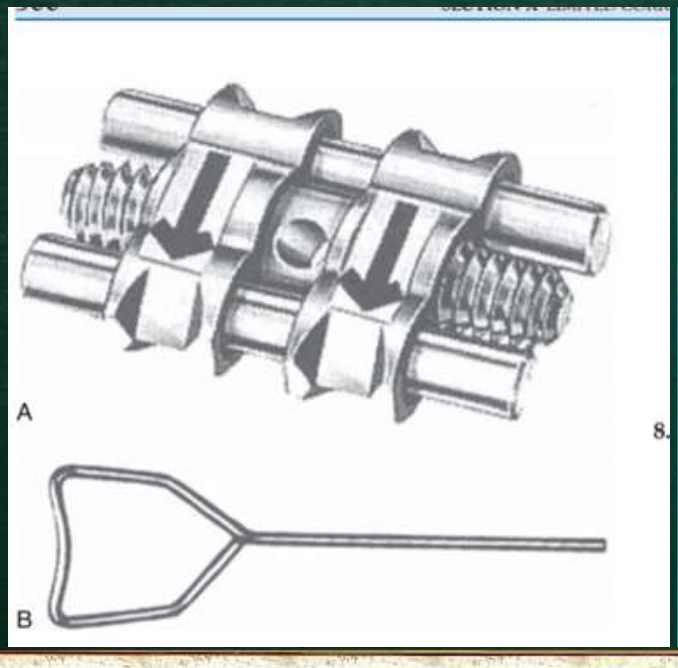
A design incorporating a screw is useful for moving blocks of teeth and has the additional advantage that the teeth being moved can also be clasped for retention. Again buccal capping is also used to free occlusion with the lower arch.

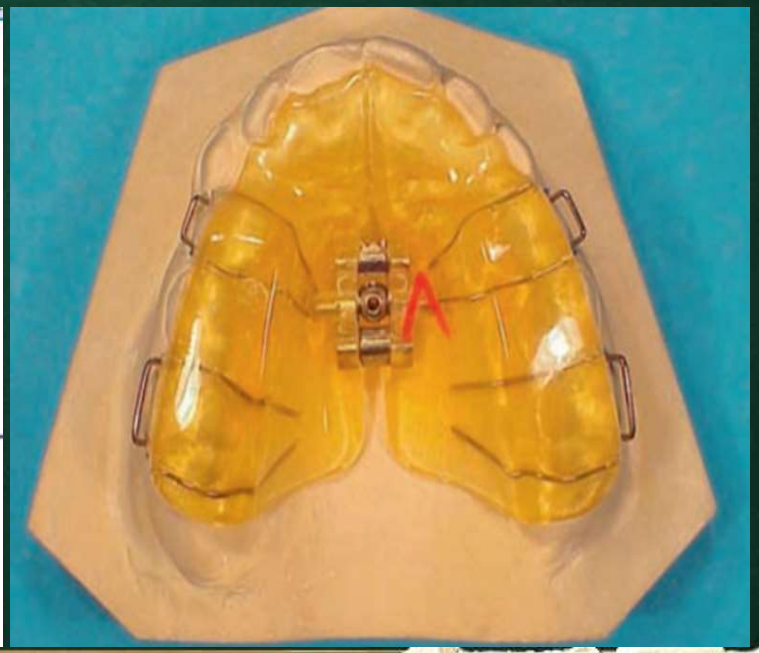




3- Screw appliance to expand upper arch

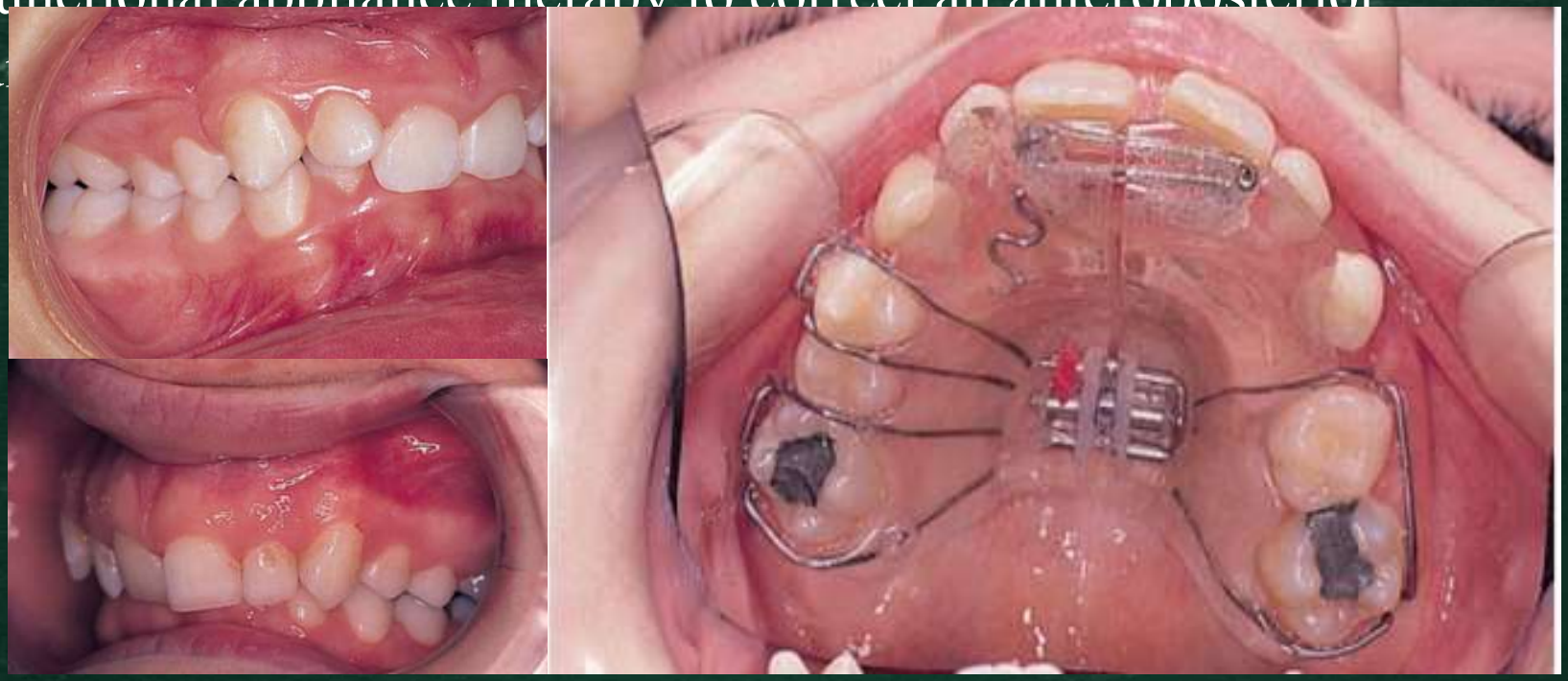
Activation: this is by means of turning the screw a one-quarter turn. One quarter-turn opens the two sections of the appliance by 0.25 mm. For active movement the patient should turn the screw twice a week (for example on a Wednesday and a Saturday). If opened too far, the screw will come apart; therefore patients should be warned that if the screw portion becomes loose they should turn it back one turn and not advance the screw again.





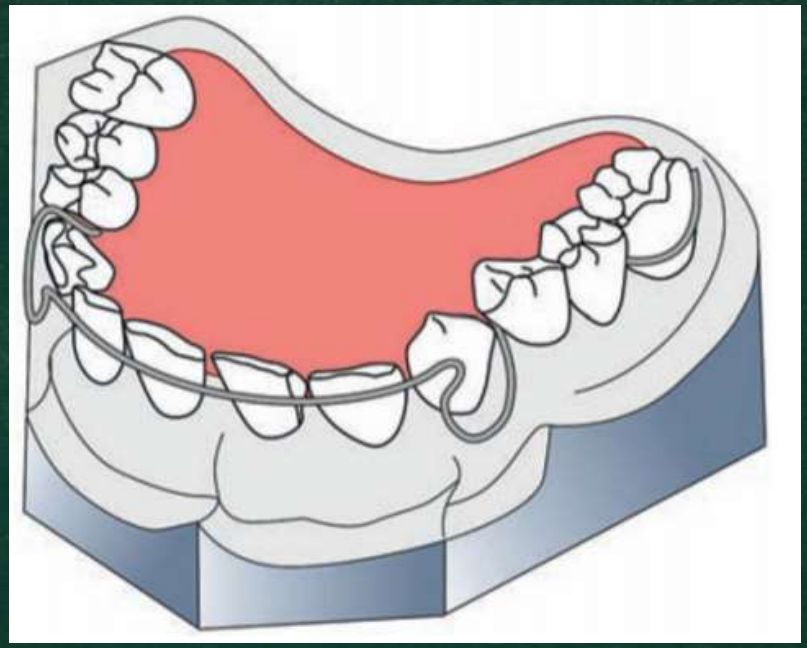
4- Expansion and Labial Segment Alignment Appliance (ELSAA)

This appliance is used in Class II division 2 maloccusions prior to functional appliance therapy to correct an anteroposterior d



An upper removable appliance used to expand the upper arch and procline the retroclined upper incisors prior to functional appliance therapy.

5- Hawley appliance



To close anterior spaces, acrylic is cut away on the lingual side of incisors and vertical loops are closed slightly, increasing labial wire pressure on incisors.

PLEASE NOTE:

activation of Hawley appliance (active Hawley) to close anterior spaces, acrylic is cut away on the lingual side of incisors and vertical loops are closed slightly, increasing labial wire pressure on incisors.

6- 'U' loop labial bow retainer {Hawley).

The appliance generally has Adams' clasps on the upper first molars and a 'U' loop labial bow lying against the incisors.

Removable appliances are:

- Only capable of tipping movements of individual teeth
- Useful for correction of mild rotation (less than 90°) by couple force system
- Useful for moving blocks of teeth (screw)
- Useful for freeing the occlusion with the opposing arch
- Useful as passive appliances
- More commonly used nowadays as an adjunct to fixed appliances (rather than the sole appliance to correct a malocclusion)